STIC Search Report
EIC 1700

STIC Database Tracking Number: 96176

TO: Camie Thompson **Location: CP3 11B28** **Art Unit : 1774** **June 10, 2003** **Case Serial Number: 10/02604**	**From: Kathleen Fuller** **Location: EIC 1700** **CP3/4 3D62** **Phone: 308-4290** **Kathleen.Fuller@uspto.gov**

Search Notes

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=> FILE HCAPLUS
FILE 'HCAPLUS' ENTERED AT 10:37:41 ON 10 JUN 2003
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FILE COVERS 1907 - 10 Jun 2003  VOL 138 ISS 24
FILE LAST UPDATED: 9 Jun 2003  (20030609/ED)

 This file contains CAS Registry Numbers for easy and accurate
 substance identification.


=> S QUE L42
MISSING OPERATOR QUE L42
The search profile that was entered contains terms or
nested terms that are not separated by a logical operator.

=> D QUE L42
L4        20830 SEA FILE=REGISTRY ABB=ON  PHTHALOCYAN?
L5           80 SEA FILE=REGISTRY ABB=ON  BENZOQUINOLIN?
L6        57343 SEA FILE=REGISTRY ABB=ON  BENZO?(L)QUINOLIN?
L7       145460 SEA FILE=REGISTRY ABB=ON  OXADIAZ?
L8       374762 SEA FILE=REGISTRY ABB=ON  TRIAZOL?
L10       11917 SEA FILE=REGISTRY ABB=ON  L8 AND 1-10/M
L11       40582 SEA FILE=REGISTRY ABB=ON  PHENANTHROLIN?
L12       31779 SEA FILE=HCAPLUS ABB=ON  L4 OR ?PHTHALOCYN?
L13       25839 SEA FILE=HCAPLUS ABB=ON  L5 OR L6 OR ?BENZOQUINOLIN?
L14       38202 SEA FILE=HCAPLUS ABB=ON  L7 OR ?OXADIAZOL?
L15       58380 SEA FILE=HCAPLUS ABB=ON  L10 OR ?TRIAZOL?
L17         103 SEA FILE=HCAPLUS ABB=ON  METAL?(3A)?HALOGENIDE?
L18       31754 SEA FILE=HCAPLUS ABB=ON  L11 OR ?PHENANTHROLIN?
L21       21860 SEA FILE=HCAPLUS ABB=ON  MIX?(3A)LAYER?
L23         690 SEA FILE=HCAPLUS ABB=ON  ELECTRON(3A)(AFFINIT? OR MOBIL?)(3A)(G
                REAT? OR LESS? OR LARGER? OR DIFFEREN?)
L29       20102 SEA FILE=HCAPLUS ABB=ON  MIX?(3A)COMPOUND#
L31         828 SEA FILE=HCAPLUS ABB=ON  IONIZATION? POTENTIAL?(3A)(SMALLER?
                OR GREAT? OR LESS? OR LARGER? OR DIFFEREN?)
L34      180486 SEA FILE=HCAPLUS ABB=ON  (L12 OR L13 OR L14 OR L15 OR L17 OR
                L18)
L35       54551 SEA FILE=HCAPLUS ABB=ON  (EL OR ELECTROLUMIN? OR LUMINESC?)
                AND (DEVICE? OR DEV/RL)
L36        2557 SEA FILE=HCAPLUS ABB=ON  L34 AND L35
L37          34 SEA FILE=HCAPLUS ABB=ON  L21 AND L36
L38          84 SEA FILE=HCAPLUS ABB=ON  L35 AND AROM? AMINE?
L39           3 SEA FILE=HCAPLUS ABB=ON  L21 AND L38
L40           3 SEA FILE=HCAPLUS ABB=ON  (L23 OR L31) AND L36
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L41           5 SEA FILE=HCAPLUS ABB=ON  L29 AND L36
L42          40 SEA FILE=HCAPLUS ABB=ON  L37 OR L39 OR L40 OR L41

=> FILE WPIX
FILE 'WPIX' ENTERED AT 10:38:12 ON 10 JUN 2003
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FILE LAST UPDATED:          9 JUN 2003      <20030609/UP>
MOST RECENT DERWENT UPDATE:     200336        <200336/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

>>> NEW WEEKLY SDI FREQUENCY AVAILABLE --> see NEWS  <<<

>>> SLART (Simultaneous Left and Right Truncation) is now
    available in the /ABEX field. An additional search field
    /BIX is also provided which comprises both /BI and /ABEX <<<

>>> PATENT IMAGES AVAILABLE FOR PRINT AND DISPLAY <<<

>>> FOR DETAILS OF THE PATENTS COVERED IN CURRENT UPDATES,
    SEE http://www.derwent.com/dwpi/updates/dwpicov/index.html <<<

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 http://www.stn-international.de/training_center/patents/stn_guide.pdf <<<

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    GUIDES, PLEASE VISIT:
    http://www.derwent.com/userguides/dwpi_guide.html <<<

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L7        145460 SEA FILE=REGISTRY ABB=ON  OXADIAZ?
L8        374762 SEA FILE=REGISTRY ABB=ON  TRIAZOL?
L10        11917 SEA FILE=REGISTRY ABB=ON  L8 AND 1-10/M
L11        40582 SEA FILE=REGISTRY ABB=ON  PHENANTHROLIN?
L12        31779 SEA FILE=HCAPLUS ABB=ON  L4 OR ?PHTHALOCYN?
L13        25839 SEA FILE=HCAPLUS ABB=ON  L5 OR L6 OR ?BENZOQUINOLIN?
L14        38202 SEA FILE=HCAPLUS ABB=ON  L7 OR ?OXADIAZOL?
L15        58380 SEA FILE=HCAPLUS ABB=ON  L10 OR ?TRIAZOL?
L17          103 SEA FILE=HCAPLUS ABB=ON  METAL?(3A)?HALOGENIDE?
L18        31754 SEA FILE=HCAPLUS ABB=ON  L11 OR ?PHENANTHROLIN?
L21        21860 SEA FILE=HCAPLUS ABB=ON  MIX?(3A)LAYER?
L23          690 SEA FILE=HCAPLUS ABB=ON  ELECTRON(3A)(AFFINIT? OR MOBIL?)(3A)(G
                REAT? OR LESS? OR LARGER? OR DIFFEREN?)
L29        20102 SEA FILE=HCAPLUS ABB=ON  MIX?(3A)COMPOUND#
L31          828 SEA FILE=HCAPLUS ABB=ON  IONIZATION? POTENTIAL?(3A)(SMALLER?
                OR GREAT? OR LESS? OR LARGER? OR DIFFEREN?)
L34       180486 SEA FILE=HCAPLUS ABB=ON  (L12 OR L13 OR L14 OR L15 OR L17 OR
                L18)
L35        54551 SEA FILE=HCAPLUS ABB=ON  (EL OR ELECTROLUMIN? OR LUMINESC?)
                AND (DEVICE? OR DEV/RL)
L36         2557 SEA FILE=HCAPLUS ABB=ON  L34 AND L35
L37           34 SEA FILE=HCAPLUS ABB=ON  L21 AND L36
L38           84 SEA FILE=HCAPLUS ABB=ON  L35 AND AROM? AMINE?
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L39           3 SEA FILE=HCAPLUS ABB=ON  L21 AND L38
L40           3 SEA FILE=HCAPLUS ABB=ON  (L23 OR L31) AND L36
L41           5 SEA FILE=HCAPLUS ABB=ON  L29 AND L36
L43          27 SEA FILE=WPIX ABB=ON  L37 OR L39 OR L40 OR L41


=>  FILE INSPEC
FILE 'INSPEC' ENTERED AT 10:38:30 ON 10 JUN 2003
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FILE LAST UPDATED: 10 JUN 2003       <20030610/UP>
FILE COVERS 1969 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN
    THE BASIC INDEX >>>

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L5           80 SEA FILE=REGISTRY ABB=ON  BENZOQUINOLIN?
L6        57343 SEA FILE=REGISTRY ABB=ON  BENZO?(L)QUINOLIN?
L7       145460 SEA FILE=REGISTRY ABB=ON  OXADIAZ?
L8       374762 SEA FILE=REGISTRY ABB=ON  TRIAZOL?
L10       11917 SEA FILE=REGISTRY ABB=ON  L8 AND 1-10/M
L11       40582 SEA FILE=REGISTRY ABB=ON  PHENANTHROLIN?
L12       31779 SEA FILE=HCAPLUS ABB=ON  L4 OR ?PHTHALOCYN?
L13       25839 SEA FILE=HCAPLUS ABB=ON  L5 OR L6 OR ?BENZOQUINOLIN?
L14       38202 SEA FILE=HCAPLUS ABB=ON  L7 OR ?OXADIAZOL?
L15       58380 SEA FILE=HCAPLUS ABB=ON  L10 OR ?TRIAZOL?
L17         103 SEA FILE=HCAPLUS ABB=ON  METAL?(3A)?HALOGENIDE?
L18       31754 SEA FILE=HCAPLUS ABB=ON  L11 OR ?PHENANTHROLIN?
L21       21860 SEA FILE=HCAPLUS ABB=ON  MIX?(3A)LAYER?
L23         690 SEA FILE=HCAPLUS ABB=ON  ELECTRON(3A)(AFFINIT? OR MOBIL?)(3A)(G
              REAT? OR LESS? OR LARGER? OR DIFFEREN?)
L29       20102 SEA FILE=HCAPLUS ABB=ON  MIX?(3A)COMPOUND#
L31         828 SEA FILE=HCAPLUS ABB=ON  IONIZATION? POTENTIAL?(3A)(SMALLER?
              OR GREAT? OR LESS? OR LARGER? OR DIFFEREN?)
L34      180486 SEA FILE=HCAPLUS ABB=ON  (L12 OR L13 OR L14 OR L15 OR L17 OR
              L18)
L35       54551 SEA FILE=HCAPLUS ABB=ON  (EL OR ELECTROLUMIN? OR LUMINESC?)
              AND (DEVICE? OR DEV/RL)
L36        2557 SEA FILE=HCAPLUS ABB=ON  L34 AND L35
L37          34 SEA FILE=HCAPLUS ABB=ON  L21 AND L36
L38          84 SEA FILE=HCAPLUS ABB=ON  L35 AND AROM? AMINE?
L39           3 SEA FILE=HCAPLUS ABB=ON  L21 AND L38
L40           3 SEA FILE=HCAPLUS ABB=ON  (L23 OR L31) AND L36
L41           5 SEA FILE=HCAPLUS ABB=ON  L29 AND L36
L44           6 SEA FILE=INSPEC ABB=ON  L37 OR L39 OR L40 OR L41


=> FILE COMPENDEX
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FILE COVERS 1970 TO DATE.


KATHLEEN FULLER EIC 1700/PARKER LAW 308-4290
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<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN
THE BASIC INDEX >>>

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L5           80 SEA FILE=REGISTRY ABB=ON  BENZOQUINOLIN?
L6        57343 SEA FILE=REGISTRY ABB=ON  BENZO?(L)QUINOLIN?
L7       145460 SEA FILE=REGISTRY ABB=ON  OXADIAZ?
L8       374762 SEA FILE=REGISTRY ABB=ON  TRIAZOL?
L10       11917 SEA FILE=REGISTRY ABB=ON  L8 AND 1-10/M
L11       40582 SEA FILE=REGISTRY ABB=ON  PHENANTHROLIN?
L12       31779 SEA FILE=HCAPLUS ABB=ON  L4 OR ?PHTHALOCYN?
L13       25839 SEA FILE=HCAPLUS ABB=ON  L5 OR L6 OR ?BENZOQUINOLIN?
L14       38202 SEA FILE=HCAPLUS ABB=ON  L7 OR ?OXADIAZOL?
L15       58380 SEA FILE=HCAPLUS ABB=ON  L10 OR ?TRIAZOL?
L17         103 SEA FILE=HCAPLUS ABB=ON  METAL?(3A)?HALOGENIDE?
L18       31754 SEA FILE=HCAPLUS ABB=ON  L11 OR ?PHENANTHROLIN?
L21       21860 SEA FILE=HCAPLUS ABB=ON  MIX?(3A)LAYER?
L23         690 SEA FILE=HCAPLUS ABB=ON  ELECTRON(3A)(AFFINIT? OR MOBIL?)(3A)(G
                REAT? OR LESS? OR LARGER? OR DIFFEREN?)
L29       20102 SEA FILE=HCAPLUS ABB=ON  MIX?(3A)COMPOUND#
L31         828 SEA FILE=HCAPLUS ABB=ON  IONIZATION? POTENTIAL?(3A)(SMALLER?
                OR GREAT? OR LESS? OR LARGER? OR DIFFEREN?)
L34      180486 SEA FILE=HCAPLUS ABB=ON  (L12 OR L13 OR L14 OR L15 OR L17 OR
                L18)
L35       54551 SEA FILE=HCAPLUS ABB=ON  (EL OR ELECTROLUMIN? OR LUMINESC?)
                AND (DEVICE? OR DEV/RL)
L36        2557 SEA FILE=HCAPLUS ABB=ON  L34 AND L35
L37          34 SEA FILE=HCAPLUS ABB=ON  L21 AND L36
L38          84 SEA FILE=HCAPLUS ABB=ON  L35 AND AROM? AMINE?
L39           3 SEA FILE=HCAPLUS ABB=ON  L21 AND L38
L40           3 SEA FILE=HCAPLUS ABB=ON  (L23 OR L31) AND L36
L41           5 SEA FILE=HCAPLUS ABB=ON  L29 AND L36
L45           5 SEA FILE=COMPENDEX ABB=ON  L37 OR L39 OR L40 OR L41

=> DUP REM L42 L43 L44 L45
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PROCESSING COMPLETED FOR L42
PROCESSING COMPLETED FOR L43
PROCESSING COMPLETED FOR L44
PROCESSING COMPLETED FOR L45
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KATHLEEN FULLER EIC 1700/PARKER LAW 308-4290

L46 69 DUP REM L42 L43 L44 L45 (9 DUPLICATES REMOVED)

=> D L46 ALL 1-69

L46 ANSWER 1 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2003:58401 HCAPLUS
DN 138:128805
TI Organic **electroluminescent device** based upon emission of exciplexes or electroplexes, and a method for its fabrication
IN Cocchi, Massimo; Giro, Gabriele; Fattori, Valeria; Di Marco, Piergiulio; Kalinowski, Jan
PA Consiglio Nazionale delle Ricerche, Italy
SO PCT Int. Appl., 29 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01L051-20
ICS H01L051-30
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 22, 76
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 2003007394	A2	20030123	WO 2002-IT458	20020712

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRAI IT 2001-TO692 A 20010713
OS MARPAT 138:128805
AB Org. **electroluminescent devices** based upon emission of exciplexes or electroplexes are described which include an anode, a cathode, a first layer, which comprises .gtoreq.1 org. material for transporting pos. charges and is set in contact with the anode, and a second layer, which comprises .gtoreq.1 org. material for transporting neg. charges and is set in contact with the cathode and with the first layer, where the org. material for transporting neg. charges and the org. material for transporting pos. charges are capable of forming exciplexes or electroplexes between them. Thus, **electroluminescent devices** employing triphenylamine derivs. as material for transporting pos. charges and **phenyltriazole** derivs. as material for transporting neg. charges were fabricated and characterized. Methods for fabricating the **electroluminescent devices** by successive deposition of the layers are also discussed.
ST org **electroluminescent device** exciplex electroplex fabrication triphenylamine **phenyltriazole**
IT Amines, uses
RL: **DEV (Device component use)**; USES (Uses)
(aryl, tertiary, pos.-charge transporting layer; org. **electroluminescent device** based upon emission of

exciplexes or electroplexes, and a method for its fabrication)
IT Alkali metals, uses
Alkaline earth metals
RL: **DEV (Device component use)**; USES (Uses)
(cathode; org. **electroluminescent device** based upon emission of exciplexes or electroplexes, and a method for its fabrication)
IT Polycarbonates, properties
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(**mixed layer** of TDATA with; org. **electroluminescent device** based upon emission of exciplexes or electroplexes, and a method for its fabrication)
IT **Electroluminescent devices**
Exciplex
Glass substrates
(org. **electroluminescent device** based upon emission of exciplexes or electroplexes, and a method for its fabrication)
IT 50926-11-9, Indium tin oxide
RL: **DEV (Device component use)**; USES (Uses)
(anode; org. **electroluminescent device** based upon emission of exciplexes or electroplexes, and a method for its fabrication)
IT 7440-22-4, Silver, uses 7440-70-2, Calcium, uses
RL: **DEV (Device component use)**; USES (Uses)
(org. **electroluminescent device** based upon emission of exciplexes or electroplexes, and a method for its fabrication)
IT 105389-36-4 124729-98-2 139092-78-7 150405-69-9 203799-76-2
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(org. **electroluminescent device** based upon emission of exciplexes or electroplexes, and a method for its fabrication)

L46 ANSWER 2 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2003:58564 HCAPLUS
DN 138:114821
TI Organic light-emitting elements which can employ non-volatile or insoluble materials and light-emitting **devices** using the elements
IN Seo, Satoshi; Murakami, Masakazu; Yamazaki, Shunpei
PA Semiconductor Energy Laboratory Co., Ltd., Japan
SO U.S. Pat. Appl. Publ., 36 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H05B033-00
NCL 313504000
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74, 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2003015960	A1	20030123	US 2002-158233	20020531
	JP 2003059666	A2	20030228	JP 2002-160435	20020531
PRAI	JP 2001-167508	A	20010601		
	JP 2001-167662	A	20010604		

AB Org. light-emitting elements are described which comprise an org. compd. layer sandwiched between an anode and a cathode, the org. **compd. layer** comprising a **mixed layer** having a plurality of org. compds. serving as a host material and a guest material, where .gtoreq.1 of the org. compds. that serve as the host material forms a uniform amorphous film, and where the guest material forms an aggregation having a diam. .ltoreq.1 than the thickness of the **mixed layer**. Light-emitting **devices** are described having a light-emitting element comprising an anode; a cathode, and an org. compd. layer placed between the anode and the cathode, the org. compd. layer contg. plural kinds of org. compds., where the org. compd. layer comprises a plurality of org. compds. that form a uniform amorphous film and .gtoreq.1 of org. compds. that are scattered in the amorphous film in the form of granule having a diam. < the thickness of the org. compd. layer.

ST org light emitting element **device** granule aggregate material

IT **Electroluminescent devices**
(displays; org. light-emitting elements which can employ non-volatile or insol. materials and light-emitting **devices** using elements)

IT **Luminescent** screens
(**electroluminescent**; org. light-emitting elements which can employ non-volatile or insol. materials and light-emitting **devices** using elements)

IT Fluorescent substances
Phosphorescent substances
(granules or guest material forming aggregates; org. light-emitting elements which can employ non-volatile or insol. materials and light-emitting **devices** using elements)

IT Electric appliances
Electroluminescent devices
(org. light-emitting elements which can employ non-volatile or insol. materials and light-emitting **devices** using elements)

IT Aggregates
Granular materials
(org. light-emitting elements which can employ non-volatile or insol. materials in form of)

IT 7440-21-3, Silicon, uses
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(cryst. film; org. light-emitting elements which can employ non-volatile or insol. materials and light-emitting **devices** using elements)

IT 7631-86-9, Silica, uses
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(gate insulating film; org. light-emitting elements which can employ non-volatile or insol. materials and light-emitting **devices** using elements)

IT 50851-57-5, Poly (styrenesulfonic acid) 126213-51-2, Poly(ethylene dioxythiophene)
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(hole injection layer contg.; org. light-emitting elements which can employ non-volatile or insol. materials and light-emitting **devices** using elements)

IT **147-14-8**, Copper phthalocyanine
RL: **DEV (Device component use)**; PEP (Physical, engineering or

chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(hole injection layer; org. light-emitting elements which can employ non-volatile or insol. materials and light-emitting **devices** using elements)

IT **15082-28-7**, 2-(4-Biphenyl)-5-(4-tert-butylphenyl)-1,3,4-**oxadiazole** 25067-59-8, Poly(N-vinylcarbazole)
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(host mixt. contg.; org. light-emitting elements which can employ non-volatile or insol. materials and light-emitting **devices** using elements)

IT 94928-86-6, Tris(2-phenylpyridine) iridium
RL: **DEV (Device component use)**; MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(insol. guest material; org. light-emitting elements which can employ non-volatile or insol. materials and light-emitting **devices** using elements)

IT 12033-89-5, Silicon nitride, uses
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(protective film; org. light-emitting elements which can employ non-volatile or insol. materials and light-emitting **devices** using elements)

L46 ANSWER 3 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2003:373902 HCAPLUS
TI Red organic light-emitting **devices**
IN Aziz, Hany; Hu, Nan-Xing; Popovic, Zoran D.; Hor, Ah-Mee
PA Xerox Corporation, USA
SO Eur. Pat. Appl., 29 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H05B033-14
ICS H05B033-12; H01L051-20
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1311141	A1	20030514	EP 2002-25110	20021108
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
	US 2003104242	A1	20030605	US 2001-5404	20011108
	JP 2003157979	A2	20030530	JP 2002-324604	20021108
PRAI	US 2001-5404	A	20011108		

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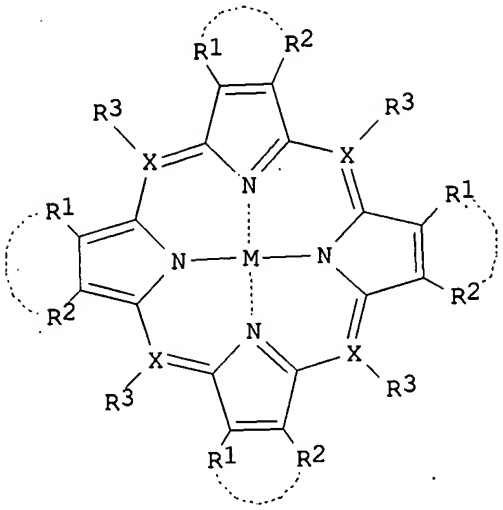


I

AB Org. light-emitting **devices** are described which comprise a first electrode; a region comprising a mixt. of a tertiary **arom. amine**, a metal oxinoid, and .apprx.1-40 wt. % of an emitting material, esp. a red-emitting material, described by the general formula I (X = C, N, or optionally O or S; R1, R2 and R3 = independently selected H, (un)substituted alkyl, and (un)substituted aryl; and M = divalent, trivalent or tetravalent metal); a second electrode; an optional protective coating on .gtoreq.1 of the first and second electrodes, one of which is a hole injection anode while the other is an electron injection cathode; .gtoreq.1 hole transport region, optionally including a buffer layer, situated between the anode and the mixed region; and an electron transport region situated between the cathode and the mixed region. Use of the **devices** in displays is also described.

ST red org light emitting **device mixed** emitting **layer**; org light emitting **device mixed** emitting **layer**

IT **Electroluminescent devices**
(org.; org. light-emitting **devices** with **mixed** emitting **layers**)

IT 2085-33-8, Tris(8-hydroxyquinoline)aluminum 7429-90-5, Aluminum 31248-39-2 37271-44-6 50926-11-9, Indium tinoxide 123847-85-8, N,N'-Di(naphthalen-1-yl)-N,N'-diphenylbenzidine 134008-76-7
RL: **DEV (Device component use)**; USES (Uses)
(org. light-emitting **devices** with **mixed** emitting **layers**)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Forrest, S; US 6303238 B1 2001 HCAPLUS
(2) Univ Princeton; WO 9920081 A 1999 HCAPLUS
(3) Wolk, M; US 6194119 B1 2001 HCAPLUS
(4) Xerox Corp; EP 1227527 A 2002 HCAPLUS

L46 ANSWER 4 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2003:373901 HCAPLUS
DN 138:376149
TI Organic light-emitting **devices** employing **mixed**

hole-transporting **layer** containing a porphyrin and a **mixed** light-emitting **layer**

IN Aziz, Hany; Vong, Cuong; Hu, Nan-Xing; Popvic, Zoran D.; Hor, Ah-Mee
PA Xerox Corporation, USA

SO Eur. Pat. Appl., 23 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H05B033-14
ICS H05B033-12; H01L051-20
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 22, 76, 78

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI EP 1311140	A1	20030514	EP 2002-25108	20021108
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
US 2003104244	A1	20030605	US 2001-5970	20011108
JP 2003151771	A2	20030523	JP 2002-324605	20021108
PRAI US 2001-5970	A	20011108		

AB Org. light-emitting **devices** are described which comprise an anode; a hole transport **layer** comprising a **mixt.** of a porphyrin and a hole transport material; a mixed region comprising a mixt. of a hole transport material, and an electron transport material, and which mixed region optionally contains an org. **luminescent** material; a cathode, and where the org. light-emitting **device** optionally further comprises .gtoreq.1 of an electron transport region interposed between the mixed region and the cathode; and an optional thermal protective element coated on 1 of the anode and cathode.

ST org **electroluminescent device** porphyrin **mixed** hole transporting **layer** OLED

IT Amines, uses
RL: **DEV (Device component use)**; USES (Uses)
(aryl, tertiary, hole-transporting material; org. light-emitting **devices** employing **mixed** hole-transporting **layer** contg. porphyrin and **mixed** light-emitting **layer**)

IT Porphyrins
RL: **DEV (Device component use)**; USES (Uses)
(hole-transporting material; org. light-emitting **devices** employing **mixed** hole-transporting **layer** contg. porphyrin and **mixed** light-emitting **layer**)

IT Fluorescent substances
Phosphorescent substances
(mixed region contg.; org. light-emitting **devices** employing **mixed** hole-transporting **layer** contg. porphyrin and **mixed** light-emitting **layer**)

IT **Electroluminescent devices**
(org. light-emitting **devices** employing **mixed** hole-transporting **layer** contg. porphyrin and **mixed** light-emitting **layer**)

IT Coordination compounds
RL: **DEV (Device component use)**; USES (Uses)
(oxinoids, electron-transporting layer; org. light-emitting **devices** employing **mixed** hole-transporting **layer** contg. porphyrin and **mixed** light-emitting

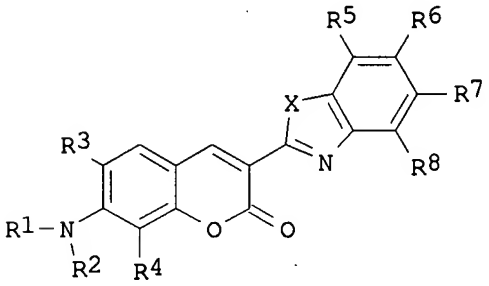
layer)
IT 91-22-5D, Quinoline, derivs. **574-93-6**, Phthalocyanine
588-59-0D, Stilbene, derivs. 6542-67-2D, Triazines, derivs.
RL: **DEV (Device component use)**; USES (Uses)
(electron-transporting material; org. light-emitting **devices** employing **mixed** hole-transporting **layer** contg. porphyrin and **mixed** light-emitting **layer**)
IT 2085-33-8, Alq3
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(electron-transporting material; org. light-emitting **devices** employing **mixed** hole-transporting **layer** contg. porphyrin and **mixed** light-emitting **layer**)
IT 517-51-1, Rubrene
RL: **DEV (Device component use)**; MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(fluorescent dopant; org. light-emitting **devices** employing **mixed** hole-transporting **layer** contg. porphyrin and **mixed** light-emitting **layer**)
IT 120-72-9D, Indole, indolocarbazoles
RL: **DEV (Device component use)**; USES (Uses)
(hole-transporting material; org. light-emitting **devices** employing **mixed** hole-transporting **layer** contg. porphyrin and **mixed** light-emitting **layer**)
IT 123847-85-8, NPB
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(hole-transporting material; org. light-emitting **devices** employing **mixed** hole-transporting **layer** contg. porphyrin and **mixed** light-emitting **layer**)
IT 86-74-8D, Carbazole, indolocarbazoles
RL: **DEV (Device component use)**; USES (Uses)
(org. light-emitting **devices** employing **mixed** hole-transporting **layer** contg. porphyrin and **mixed** light-emitting **layer**)
IT **147-14-8**, Copper phthalocyanine
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(org. light-emitting **devices** employing **mixed** hole-transporting **layer** contg. porphyrin and **mixed** light-emitting **layer**)
IT 7631-86-9, Silicon oxide (SiO2), uses 113443-18-8, Silicon oxide (SiO)
RL: **DEV (Device component use)**; USES (Uses)
(thermal protective coating; org. light-emitting **devices** employing **mixed** hole-transporting **layer** contg. porphyrin and **mixed** light-emitting **layer**)
RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Eastman Kodak Co; EP 0704912 A 1996
(2) Eastman Kodak Co; EP 0903964 A 1999 HCAPLUS
(3) Gorsuch, C; US 5925980 A 1999 HCAPLUS
(4) Ikeda, N; US 5858562 A 1999 HCAPLUS
(5) So, F; US 6114055 A 2000 HCAPLUS

L46 ANSWER 5 OF 69 HCAPLUS COPYRIGHT 2003 ACS

AN 2003:373900 HCAPLUS
DN 138:376148
TI Green organic light emitting **devices** employing a mixture of a tertiary **aromatic amine**, a metal oxinoid, and a green-emitting coumarin dye
IN Aziz, Hany; Vong, Cuong; Hu, Nan-Xing; Popovic, Zoran D.; Hor, Ah-Mee
PA Xerox Corporation, USA
SO Eur. Pat. Appl., 32 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H05B033-14
ICS H05B033-12; H01L051-20
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 22, 76
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI EP 1311139	A1	20030514	EP 2002-25106	20021108
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
US 2003104243	A1	20030605	US 2001-5518	20011108
JP 2003157980	A2	20030530	JP 2002-324606	20021108
PRAI US 2001-5518	A	20011108		

GI



I

AB Org. light-emitting **devices** are described which comprise a first electrode; a mixed region comprising a mixt. of a tertiary **arom. amine**, a metal oxinoid, and a green-emitting coumarin dye of the formula I, where X is selected from the group consisting of O, S, an alkyl imino group and aryl imino group; R1 and R2 are individually selected from the group consisting of alkyl, aryl, and carbocyclic; R3 and R4 are individually selected from the group consisting of H, alkyl, and optionally a branched or unbranched 5 or 6 member substituent ring connecting with R1 and R2, resp.; and R5-8 are individually selected from the group consisting of H, an alkoxy group and an alkyl group; a second electrode; an optional thermal protective element coated on 1 of the first and second electrodes, where 1 of the electrodes is a hole-injecting anode, and 1 of the electrodes is an electron-injecting cathode, and where the org. light-emitting **device** further comprises .gtoreq.1 of a hole-transport region interposed or situated between the anode and the mixed region, where the hole-transport region optionally includes a buffer layer; and an electron-transport region interposed between the cathode and

the mixed region, and where the green-emitting dye is present in an amt. of .apprxeq.0.01-10 wt. % based on the total of the **mixed layer** components.

ST green org **electroluminescent device** coumarin dye; OLED tertiary **arom amine** metal oxinoid green coumarin dye

IT Amines, uses
RL: **DEV (Device component use)**; USES (Uses)
(aryl, tertiary; green org. light emitting **devices** employing mixt. of tertiary **arom. amine**, metal oxinoid, and green-emitting coumarin dye)

IT Dyes
(coumarin; green org. light emitting **devices** employing mixt. of tertiary **arom. amine**, metal oxinoid, and green-emitting coumarin dye)

IT **Electroluminescent devices**
(displays; green org. light emitting **devices** employing mixt. of tertiary **arom. amine**, metal oxinoid, and green-emitting coumarin dye)

IT **Luminescent** screens
(**electroluminescent**; green org. light emitting **devices** employing mixt. of tertiary **arom. amine**, metal oxinoid, and green-emitting coumarin dye)

IT **Electroluminescent devices**
(green-emitting; green org. light emitting **devices** employing mixt. of tertiary **arom. amine**, metal oxinoid, and green-emitting coumarin dye)

IT Coordination compounds
RL: **DEV (Device component use)**; USES (Uses)
(oxinoid; green org. light emitting **devices** employing mixt. of tertiary **arom. amine**, metal oxinoid, and green-emitting coumarin dye)

IT **147-14-8**, Copper phthalocyanine
RL: **DEV (Device component use)**; USES (Uses)
(buffer layer; green org. light emitting **devices** employing mixt. of tertiary **arom. amine**, metal oxinoid, and green-emitting coumarin dye)

IT 2085-33-8, Tris(8-hydroxyquinoline)aluminum
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(electron-transporting layer; green org. light emitting **devices** employing mixt. of tertiary **arom. amine**, metal oxinoid, and green-emitting coumarin dye)

IT 166036-16-4 166036-17-5 266349-83-1
RL: **DEV (Device component use)**; PRP (Properties); USES (Uses)
(electron-transporting layer; green org. light emitting **devices** employing mixt. of tertiary **arom. amine**, metal oxinoid, and green-emitting coumarin dye)

IT 134008-76-7
RL: **DEV (Device component use)**; USES (Uses)
(green org. light emitting **devices** employing mixt. of tertiary **arom. amine**, metal oxinoid, and green-emitting coumarin dye)

IT 155306-71-1, C 545T
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(green org. light emitting **devices** employing mixt. of

tertiary **arom. amine**, metal oxinoid, and green-emitting coumarin dye)

IT 123847-85-8, NPB
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(hole-transporting layer; green org. light emitting **devices** employing mixt. of tertiary **arom. amine**, metal oxinoid, and green-emitting coumarin dye)

IT 7631-86-9, Silica, uses 113443-18-8, Silicon oxide (SiO)
RL: **DEV (Device component use)**; USES (Uses)
(thermal protective layer; green org. light emitting **devices** employing mixt. of tertiary **arom. amine**, metal oxinoid, and green-emitting coumarin dye)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Eastman Kodak Co; EP 0903964 A 1999 HCAPLUS
(2) Gorsuch, C; US 5925980 A 1999 HCAPLUS
(3) Kaneko, N; US 5834894 A 1998 HCAPLUS
(4) Shi, J; APPLIED PHYSICS LETTERS 1997, V70(13), P1665 HCAPLUS
(5) So, F; US 6114055 A 2000 HCAPLUS
(6) Univ Princeton; WO 9920081 A 1999 HCAPLUS

L46 ANSWER 6 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2003:298769 HCAPLUS
DN 138:311332
TI Method of manufacturing organic **electroluminescent device** involving spraying of organic soln. by using a pressurized gas
IN Naka, Shigeki; Echigo, Tadahiro; Okada, Hiroyuki; Onnagawa, Hiroyoshi
PA President of Toyama University, Japan
SO Eur. Pat. Appl., 12 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H01L051-40
ICS H01L051-20
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 22, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1302991	A2	20030416	EP 2002-22651	20021009
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
	JP 2003123968	A2	20030425	JP 2001-316871	20011015
	US 2003087464	A1	20030508	US 2002-268791	20021011
PRAI	JP 2001-316871	A	20011015		

AB Methods of manufg. org. **electroluminescent devices** are discussed which entail forming a first electrode on a substrate; forming on the first electrode .gtoreq.1 org. thin film layer contg. .gtoreq.1 material selected from a hole-transporting org. material, an electron-transporting org. material, and a **luminescent** org. material; and forming a second electrode on the org. thin film layer; characterized in that the step of forming the org. thin film layer entails prepg. a soln. contg. the .gtoreq.1 material selected from a hole-transporting org. material, an electron-transporting org. material,

and a **luminescent** org. material; and spraying the soln. onto the first electrode by using a pressurized gas.

ST org **electroluminescent device** fabrication spraying pressurized gas OLED

IT Amines, uses
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(aryl, tertiary, hole-transporting layer; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas)

IT Transparent materials
(elec. insulating, substrate; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas on)

IT Electronic **device** fabrication
Spraying
(method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas)

IT Ink-jet printing
(method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas and depositing remaining org. layers by)

IT Electrodes
(reflective; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas on)

IT Coating process
(spin; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas and depositing remaining org. layers by)

IT **Electroluminescent devices**
(thin-film; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas)

IT Electric insulators
(transparent, substrate; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas on)

IT Electrodes
(transparent; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas on)

IT Vapor deposition process
(vacuum; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas and depositing remaining org. layers by)

IT 50926-11-9, Indium tin oxide
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(anode; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas on)

IT 198-55-0, Perylene
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(blue-emitting material; method of manufg. org. **electroluminescent device** involving spraying of org.

soln. by using pressurized gas)
IT 7429-90-5, Aluminum, uses 7789-24-4, Lithium fluoride, uses
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(cathode layer; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas and using)
IT **905-62-4**
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(electron-transporting layer; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas)
IT 38215-36-0, Coumarin 6
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(green-emitting material; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas)
IT 25067-59-8, Polyvinylcarbazole
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(hole-transporting layer; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas)
IT 50851-57-5 126213-51-2
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(hole-transporting **mixed layer** contg.; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas)
IT 7727-37-9, Nitrogen, uses
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(pressurized gas; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas)
IT 200052-70-6
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(red-emitting material; method of manufg. org. **electroluminescent device** involving spraying of org. soln. by using pressurized gas)

L46 ANSWER 7 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 2003-300414 [29] WPIX
DNN N2003-239115 DNC C2003-078116
TI New pyrazolone complexes of non-rare earth, transition, lanthanide or actinide metals useful in **electroluminescent devices** e.g. displays.
DC A85 E12 L03 U11 U14 X26
IN GANESHAMURUGAN, S; KATHIRGAMANATHAN, P; SURENDRAKUMAR, S
PA (ELAM-N) ELAM-T LTD

CYC 100
PI WO 2003006573 A1 20030123 (200329)* EN 51p C09K011-06
RW: AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SK SL SZ TR TZ UG ZM ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VN YU ZA ZM ZW
ADT WO 2003006573 A1 WO 2002-GB3163 20020709
PRAI GB 2001-16644 20010709
IC ICM C09K011-06
ICS H05B033-14
AB WO2003006573 A UPAB: 20030505
NOVELTY - Pyrazolone complexes (I) of non-rare earth, transition, lanthanide or actinide metals are new.

DETAILED DESCRIPTION - An **electroluminescent** complex of formula (I) is new.

M = a metal other than a rare earth, a transition metal, a lanthanide or an actinide;

n = valency of M; and

R1-R3 = H, hydrocarbyl, optionally substituted aliphatic, optionally substituted aromatic, heterocyclic or polycyclic ring structures, fluorocarbon (e.g. trifluoromethyl), halogen (e.g. fluorine), thiophenyl or nitrile.

R1 and R3 can also form ring structures. R1-R3 can be polymerizable with a monomer, e.g. styrene.

An INDEPENDENT CLAIM is also included for an **electroluminescent device**, comprising a first electrode; an **electroluminescent** layer having a layer of a complex of formula (I); and a second electrode.

USE - The complex is used in an **electroluminescent device** (claimed), useful in a wide range of display applications.

Dwg.8/19
FS CPI EPI
FA AB; GI; DCN
MC CPI: A12-E11C; E05-A; E05-B; E05-D; E05-F; E05-L; E05-M; E05-N; E24-A05; E25-E; E25-E01; L03-D01D; L03-G05F
EPI: U11-A15B; U14-J01; U14-J02D2; X26-J

L46 ANSWER 8 OF 69 HCAPLUS COPYRIGHT 2003 ACS DUPLICATE 1
AN 2002:503506 HCAPLUS
DN 137:70360
TI Organic **electroluminescent devices** using **mixed layers**
IN Seo, Satoshi; Yamazaki, Shunpei
PA Semiconductor Energy Laboratory Co., Ltd., Japan
SO Eur. Pat. Appl., 67 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H01L051-20
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

application

PI EP 1220340 A2 20020703 EP 2001-130872 20011227
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR
US 2002086180 A1 20020704 US 2001-26064 20011221
CN 1362746 A 20020807 CN 2001-130273 20011228
JP 2002313583 A2 20021025 JP 2001-399072 20011228
PRAI JP 2000-400953 A 20001228
JP 2001-20817 A 20010129
JP 2001-32406 A 20010208

AB Org. **electroluminescent devices** are described in which .gtoreq.1 of the layers making up the **devices** comprises a mixt. of materials having desired properties. The layers may include a hole transporting **mixed layer** comprising a hole injecting material and a hole transporting material, a **mixed layer** comprising a hole transporting material and an electron transporting material, or an electron transporting **mixed layer** comprising an electron transporting material 813 and an electron injecting material. The **mixed layers** may be compositionally graded.

ST org **electroluminescent device mixed layer**

IT **Electroluminescent devices**
(org.; org. **electroluminescent devices** using **mixed layers**)

IT **147-14-8**, Copper phthalocyanine **1662-01-7**, **Bathophenanthroline** 2085-33-8, Tris(8-hydroxyquinolinato)aluminum 7789-24-4, Lithium fluoride, uses **15082-28-7**, 2-(4-Biphenylyl)-5-(4-tert-butylphenyl)-1,3,4-**oxadiazole** 18115-70-3, Lithium acetylacetonate, uses 50926-11-9, Indium tin oxide 58328-31-7, 4,4'-N,N'-Dicarbazolylbiphenyl 91650-87-2 94928-86-6, Tris(2-phenylpyridine)iridium 123847-85-8, 4,4'-Bis[N-(1-naphthyl)-N-phenylamino]biphenyl 124729-98-2, 4,4',4''-Tris[N-(3-methylphenyl)-N-phenylamino]triphenylamine 146162-54-1 **148896-39-3**, Bis(10-hydroxybenzo[h]quinolinato)beryllium
RL: **DEV (Device component use)**; USES (Uses)
(org. **electroluminescent devices** using **mixed layers**)

IT 198-55-0, Perylene 517-51-1, Rubrene **4733-39-5**, Bathocuproine 51325-91-8, 4-(Dicyanomethylene)-2-methyl-6-(p-dimethylaminostyryl)-4H-pyran
RL: **DEV (Device component use)**; MOA (Modifier or additive use); USES (Uses)
(org. **electroluminescent devices** using **mixed layers**)

L46 ANSWER 9 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2002:927959 HCAPLUS
DN 138:18150
TI Display **devices** with organic-metal **mixed layer**
IN Aziz, Hany; Liew, Yoon-fei; Popovic, Zoran D.; Hu, Nan-xing; Paine, Anthony J.
PA Xerox Corporation, USA
SO U.S. Pat. Appl. Publ., 35 pp., Cont.-in-part of U. S. Ser. No. 800,716, abandoned.
CODEN: USXXCO
DT Patent
LA English

IC ICM H05B033-00
NCL 313506000
CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002180349	A1	20021205	US 2002-117812	20020405
PRAI	US 2001-800716	B2	20010308		

AB A display **device** comprises: (a) a cathode; (b) an anode; (c) a **luminescent** region between the cathode and the anode; and an optional region adjacent one of the electrodes. At least one of the cathode, the anode, the **luminescent** region, and the optional region includes a metal-org. **mixed layer** comprising: (i) an inorg. metal contg. material, (ii) an org. material, and (iii) optionally, at least one component selected from the group consisting of metals, org. materials, and inorg. materials.

ST Light emitting display **device** org metal **mixed layer**

IT **Electroluminescent devices**
(display **devices** with org.-metal **mixed layer**)

IT 7440-58-6, Hafnium, uses
RL: **DEV (Device component use)**; USES (Uses)
(display **devices** with org.-metal **mixed layer**)

IT 2085-33-8, Tris(8-hydroxyquinoline)aluminum 7429-90-5, Aluminum, uses 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-91-0, Lanthanum, uses 7439-92-1, Lead, uses 7439-93-2, Lithium, uses 7439-95-4, Magnesium, uses 7439-98-7, Molybdenum, uses 7440-00-8, Neodymium, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-09-7, Potassium, uses 7440-16-6, Rhodium, uses 7440-17-7, Rubidium, uses 7440-18-8, Ruthenium, uses 7440-19-9, Samarium, uses 7440-20-2, Scandium, uses 7440-22-4, Silver, uses 7440-23-5, Sodium, uses 7440-24-6, Strontium, uses 7440-25-7, Tantalum, uses 7440-26-8, Technetium, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-36-0, Antimony, uses 7440-39-3, Barium, uses 7440-41-7, Beryllium, uses 7440-42-8, Boron, uses 7440-43-9, Cadmium, uses 7440-45-1, Cerium, uses 7440-46-2, Cesium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-53-1, Europium, uses 7440-55-3, Gallium, uses 7440-57-5, Gold, uses 7440-62-2, Vanadium, uses 7440-65-5, Yttrium, uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses 7440-69-9, Bismuth, uses 7440-70-2, Calcium, uses 7440-74-6, Indium, uses 7782-49-2, Selenium, uses 7789-24-4, Lithium fluoride, uses 13494-80-9, Tellurium, uses
RL: **DEV (Device component use)**; USES (Uses)
(display **devices** with org.-metal **mixed layer** contg.)

IT **147-14-8**, Copper Phthalocyanine 25233-34-5, Polythiophene 31248-39-2 50926-11-9, Indium-Tin-Oxide 65181-78-4, N,N'-Diphenyl-N,N'-bis3-methylphenyl-1,1-biphenyl-4,4'-diamine 123847-85-8 155306-71-1 221544-76-9 266349-83-1
RL: TEM (Technical or engineered material use); USES (Uses)
(display **devices** with org.-metal **mixed layer** contg.)

L46 ANSWER 10 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2002:616081 HCAPLUS
DN 137:161254
TI Light emitting **device** and manufacturing method thereof
IN Seo, Satoshi; Yamazaki, Shunpei
PA Japan
SO U.S. Pat. Appl. Publ., 41 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H01L035-24
NCL 257040000
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002109136	A1	20020815	US 2002-43812	20020110
	JP 2002319492	A2	20021031	JP 2002-10748	20020118
PRAI	JP 2001-10887	A	20010118		

AB A org. light emitting **device** is described comprising an anode; a cathode; and an org. compd. film sandwiched between the anode and the cathode, wherein the org. compd. film comprises at least two compds. selected from the group consisting of a hole injecting compd. that receives holes from the anode; a hole transporting compd. that has a hole mobility that is **larger** than its **electron mobility**; an **electron** transporting compd. that has an **electron mobility** that is **larger** than its hole **mobility**; an **electron** injecting compd. that receives electrons from the cathode; and a blocking compd. capable of stopping the movement of holes or electrons, wherein the two compds. selected are materials capable of undergoing vacuum evapn., wherein the org. compd. film comprises a region in which the two compds. are mixed, and wherein the elec. current vs. elec. voltage property of the org. light emitting elements show a rectification property, wherein the org. compd. film comprises a region in which the first and the second org. **compd.** are **mixed**, wherein the concn. of the two compds. change within the region, or wherein the org. compd. film comprises a region in which the concn. of the first and the second org. compd. continuously changes. A method of fabricating the light emitting **device** is also described entailing providing a substrate comprising an electrode; making a vacuum chamber comprising at least first and second org. compd. evapn. sources in a reduced pressure state by reducing the pressure within the vacuum chamber to be equal to or less than 10-3 Pa; and performing evapn. of the first org. compd. in the first org. compd. evapn. source and a second org. compd. contained in the second org. compd. evapn. source on the substrate while a pump for reducing the pressure within the vacuum chamber is operated. wherein each of the first and second org. compd. evapn. sources comprises a container comprising an org. compd., and wherein the second org. compd. is evapd. next after the first org. compd. is evapd., under a state in which the first org. compd. evapn. source is not heated and in which an atm. of the first org. compd. remains within the vacuum chamber.

ST light emitting **device** org fabrication
IT **Electroluminescent devices**
Electronic **device** fabrication
(light emitting **device** and fabrication method)

IT 119-91-5D, Cuproin, vaso-derivs. **147-14-8**, Copper phthalocyanine 2085-33-8, AlQ3 **4733-39-5**, BCP 7429-90-5, Aluminum, uses 7439-88-5, Iridium, uses 7440-06-4, Platinum, uses 7440-41-7, Beryllium, uses 7440-66-6, Zinc, uses 14752-00-2, Aluminum Tris(4-methyl-8-quinolinolate) **15082-28-7**, 2-(4-Biphenyl)-5-(4-tert-butylphenyl)-1,3,4-**oxadiazole** 31248-39-2, (2,3,7,8,12,13,17,18-Octaethyl-21H-23H-porphyrin)platinum 58328-31-7 65181-78-4, 4,4'-Bis[N-(3-methylphenyl)-N-phenyl-amino]-biphenyl 94928-86-6, Tris(2-phenylpyridine)iridium 123847-85-8, 4,4'-Bis[N-(1-naphthyl)-N-phenyl-amino]-biphenyl 124729-98-2 **138372-67-5 148896-39-3** 149005-33-4 150405-69-9 163226-12-8
RL: **DEV (Device component use)**; USES (Uses)
(light emitting **device** and fabrication method)

L46 ANSWER 11 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2002:575513 HCAPLUS
DN 137:131918
TI Organic light emitting element and display **device** using the element
IN Seo, Satoshi; Yamazaki, Shunpei
PA Japan
SO U.S. Pat. Appl. Publ., 49 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H01J001-62
NCL 313506000
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74, 76

applicants

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002101154	A1	20020801	US 2002-60427	20020129
	JP 2002305085	A2	20021018	JP 2002-25701	20020201
	CN 1378409	A	20021106	CN 2002-118312	20020201
PRAI	JP 2001-25971	A	20010201		

AB Org. light-emitting **devices** are described in which the org. **layers** include a **mixed** region (e.g., a layer in which both a hole-transporting material and electron-transporting material are mixed, a region in which a hole-transporting material and the host material for the light-emitting material are mixed, etc.). Interfaces between resp. layers which exist in a conventional multilayered structure are eliminated. Preferably, the light-emitting layer(s) include a red-emitting triplet material. Electronic equipment (org. **electroluminescent** displays, video cameras, digital cameras, image reprodn. app., portable computers, personal computers, mobile telephones, and acoustic equipment) employing the **devices** is also described.

ST org light emitting **device** display **mixed layer**

IT **Electroluminescent devices**
(displays, org.; org. light-emitting **devices** with **mixed** org. **layers** and display **devices** using them)

IT **Luminescent** screens
(**electroluminescent**, org.; org. light-emitting **devices** with **mixed** org. **layers** and display **devices** using them)

IT **Electroluminescent devices**
(org.; org. light-emitting **devices** with **mixed** org. **layers** and display **devices** using them)
IT **147-14-8**, Copper phthalocyanine 2085-33-8, Tris(8-hydroxyquinolinato)aluminum **4733-39-5**, Bathocuproin 7440-69-9, Bismuth, uses 12798-95-7 31248-39-2, 2,3,7,8,12,13,17,18-Octaethyl-21H,23H-porphyrinplatinum 50926-11-9, ITO 52934-06-2, Gallium zinc oxide 58328-31-7 123847-85-8, 4,4'-Bis[N-(1-naphthyl)-N-phenylamino]biphenyl 146162-54-1
RL: **DEV (Device component use)**; USES (Uses)
(org. light-emitting **devices** with **mixed** org. **layers** and display **devices** using them)

L46 ANSWER 12 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2002:466499 HCAPLUS
DN 137:39172
TI Highly stable and efficient OLEDs with a phosphorescent-doped **mixed layer** architecture
IN Kwong, Raymond C.; Hack, Michael G.; Zhou, Theodore; Brown, Julia J.; Ngo, Tan D.
PA USA
SO U.S. Pat. Appl. Publ., 12 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H01J063-04
ICS H01J001-62
NCL 313504000
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74, 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002074935	A1	20020620	US 2000-738429	20001215
	WO 2002047457	A2	20020620	WO 2001-US47169	20011210
	W: AU, AZ, BR, BY, CH, CN, CO, DE, DK, EE, ES, FI, GB, GM, HU, ID, KP, KR, LK, LR, LV, MA, MW, MX; PH, PL, RO, RU, SG, SI, TJ, VN, AM, AZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MZ, TZ, ZM, AT, BE, DE, DK, ES, FI, FR, GB, GR, IE, LU, MC, NL, CF, CI, GA, ML, MR, NE, SN, TD, TG				
	AU 2002030675	A5	20020624	AU 2002-30675	20011210
PRAI	US 2000-738429	A	20001215		
	WO 2001-US47169	W	20011210		

AB Org. light-emitting **devices** are described which comprise a substrate; an anode layer over the substrate; a hole injecting layer over the anode **layer**; a **mixed layer** over the hole injecting **layer**, the **mixed layer** functioning as an emission layer and comprising an org. small mol. hole transporting material, an org. small mol. electron transporting material, and a phosphorescent dopant; and a cathode **layer** over the **mixed layer**. An electron transporting layer may be present between the **mixed layer** and the cathode layer and a hole transporting layer may be present between the hole injecting **layer** and the **mixed layer**. Multicolor displays employing the **devices** as pixels are also described.
ST org light emitting **device** phosphorescent material doped active layer

IT Phosphorescent substances
(org. light-emitting **devices** with a phosphorescent-doped **mixed layer** architecture)
IT **Electroluminescent devices**
(org.; org. light-emitting **devices** with a phosphorescent-doped **mixed layer** architecture)
IT **147-14-8**, Copper phthalocyanine 2085-33-8, Tris(8-hydroxyquinoline)aluminum 7429-90-5, Aluminum, uses 7789-24-4, Lithium fluoride (LiF), uses 37271-44-6 50926-11-9, Indium tin oxide 123847-85-8
RL: **DEV (Device component use)**; USES (Uses)
(org. light-emitting **devices** with a phosphorescent-doped **mixed layer** architecture)
IT 31248-39-2 343978-79-0
RL: **DEV (Device component use)**; MOA (Modifier or additive use); USES (Uses)
(org. light-emitting **devices** with a phosphorescent-doped **mixed layer** architecture)

L46 ANSWER 13 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2002:450225 HCAPLUS
DN 137:25995
TI Organic blue- and white-light-emitting **devices**
IN Fujii, Hiroyuki
PA Sanyo Electric Co., Ltd., Japan
SO U.S. Pat. Appl. Publ., 18 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H05B033-14
NCL 428690000
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 27, 76, 78
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002071963	A1	20020613	US 2001-11313	20011211
	JP 2002184581	A2	20020628	JP 2000-379404	20001213
	EP 1215945	A2	20020619	EP 2001-310369	20011212

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

PRAI JP 2000-379404 A 20001213
AB Org. light-emitting **devices** are described which comprise an anode; a cathode; and a **luminescent** substance placed between the anode and the cathode, where the **luminescent** substance includes at least a mol. substance in which an absorption edge of the longest wavelength in an optical absorption spectrum in a visible light range is located at a shorter wavelength as compared to that of 4,4'-bis(carbazol-9-yl)biphenyl. Thus, white-emitting **luminescent devices** were fabricated and characterized which contain a **mixed luminescent layer** including 4,4',4''-tri(N-carbazolyl)triphenylamine as a **luminescent** substance and fac-tris(2-phenylpyridine)iridium as a substance emitting light through a triplet excited state.
ST org light emitting **device** blue white; OLED white blue
IT **Electroluminescent devices**
(blue- and white-emitting org. **electroluminescent**

devices)
IT Transition metal complexes
RL: **DEV (Device component use)**; USES (Uses)
(heterocyclic compd.; org. light emitting **devices** using **luminescent** material emitting through triplet excited state and based on)
IT **Luminescent** substances
(org. light emitting **devices** using **luminescent** material emitting through triplet excited state)
IT Group IB element compounds
Group VIII element compounds
RL: **DEV (Device component use)**; USES (Uses)
(org. light emitting **devices** using **luminescent** material emitting through triplet excited state and based on)
IT Heterocyclic compounds
RL: **DEV (Device component use)**; USES (Uses)
(transition metal complexes; org. light emitting **devices** using **luminescent** material emitting through triplet excited state and based on)
IT 50926-11-9, Indium tin oxide
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(anode; fabrication of org. white-light-emitting **devices** using)
IT 221042-24-6
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(cathode; fabrication of org. white-light-emitting **devices** using)
IT **4733-39-5**, 2,9-Dimethyl-4,7-diphenyl-1,10-**phenanthroline**
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(electron-blocking layer; fabrication of org. white-light-emitting **devices** using)
IT 2085-33-8, Alq3
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(electron-injection layer; fabrication of org. white-light-emitting **devices** using)
IT 124729-98-2
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(hole-injection layer; fabrication of org. white-light-emitting **devices** using)
IT 123847-85-8, 4,4'-Bis[N-(1-naphthyl)-N-phenylamino]biphenyl
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(hole-transporting layer; fabrication of org. white-light-emitting **devices** using)
IT 200052-70-6
RL: **DEV (Device component use)**; USES (Uses)
(**luminescent** layer contg.; fabrication of org.

white-light-emitting **devices** using)

IT 94928-86-6, fac-Tris(2-phenylpyridine)iridium 139092-78-7 434938-12-2
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(**luminescent layer** of **mixt.** contg.; fabrication of org. white-light-emitting **devices** using)

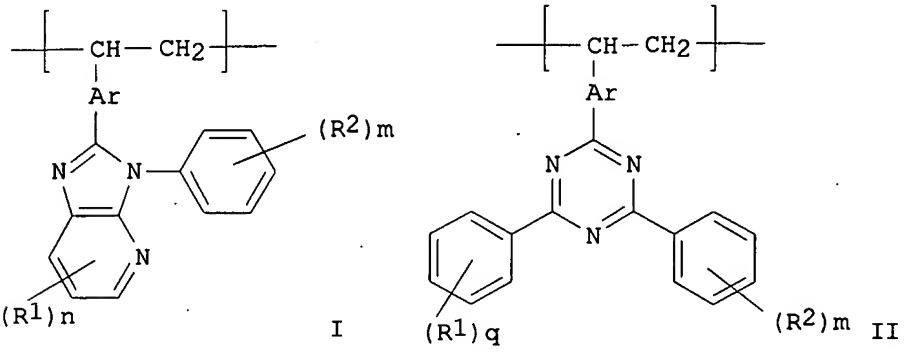
IT 7439-88-5D, Iridium, compd. 7440-04-2D, Osmium, compd. 7440-06-4D, Platinum, compd. 7440-57-5D, Gold, compd.
RL: **DEV (Device component use)**; USES (Uses)
(org. light emitting **devices** using **luminescent** material emitting through triplet excited state and contg.)

L46 ANSWER 14 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2002:354001 HCAPLUS
DN 136:377202
TI Light-emitting **device** and material therefor
IN Okada, Hisashi; Ise, Toshihiro; Mishima, Masayuki; Taguchi, Toshiki
PA Fuji Photo Film Co., Ltd., Japan
SO U.S. Pat. Appl. Publ., 91 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H05B033-14
ICS C08F026-06
NCL 428690000
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 27, 28, 38, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002055014	A1	20020509	US 2001-935711	20010824
	JP 2002319491	A2	20021031	JP 2001-236419	20010803
PRAI	JP 2000-254171	A	20000824		
	JP 2001-38718	A	20010215		
	JP 2001-236419	A	20010803		

OS MARPAT 136:377202
GI



AB Light-emitting **devices** comprising a pair of electrodes formed on a substrate and org. compd. layers comprising a light-emitting layer

provided in between the electrodes are described in which .gtoreq.1 of the org. compd. layers comprises a heterocyclic compd. having .gtoreq.2 atoms and a phosphorescent compd.; polymers with repeating units described by the general formulas I and II (Ar = arylene or divalent heterocyclic group; R1 and R2 = independently selected H or substituent; n = 0-3; q = 0-5; and m = 0-5), which may be employed as the heterocyclic compds. in the **devices**, are also described. The **devices** may also employ polymers of heterocyclic compds. from which AR is absent. The phosphorescent compd. may be an org. metal complex.

ST **electroluminescent device** heterocycle phosphorescent **compd mixt** active **layer**; polymer heterocycle phosphorescent **compd mixt** active **layer** **electroluminescent device**

IT Phosphorescent substances
(light-emitting **devices** with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT Polycarbonates, uses
RL: **DEV (Device component use)**; USES (Uses)
(light-emitting **devices** with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT **Electroluminescent devices**
(org.; light-emitting **devices** with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT **147-14-8**, Copper phthalocyanine 2085-33-8, Tris(8-hydroxyquinolinato)aluminum **4733-39-5**, Bathocuproine 7429-90-5, Aluminum, uses 7789-24-4, Lithium fluoride, uses 12033-89-5, Silicon nitride, uses **15082-28-7** 24964-91-8, Tris(4-bromophenyl)aminium hexachloroantimonate 25067-59-8, Poly(N-vinylcarbazole) 37271-44-6 38215-36-0, Coumarin-6 50926-11-9, ITO 51269-91-1 58328-31-7 65181-78-4, N,N'-Bis(3-methylphenyl)-N,N'-diphenylbenzidine 94928-86-6 153838-48-3 173394-18-8 182069-71-2 343978-78-9 350025-75-1 350025-76-2 350025-78-4 350025-79-5 359014-69-0 370878-69-6 377092-13-2 422574-54-7, Silicon nitride oxide (SiN0.300.7) 422574-58-1 422574-60-5 422574-62-7 422574-66-1 422574-67-2 422574-68-3 422574-70-7 422574-72-9 422574-73-0 422574-74-1 422574-76-3 422574-77-4 422574-78-5 422574-84-3 422574-85-4 422574-86-5 422574-87-6 422574-88-7 422574-89-8 422574-90-1 423117-91-3 423117-92-4 423117-94-6 423117-96-8 423117-97-9 423117-99-1 423118-00-7 423118-01-8 423118-03-0 423118-05-2 423721-05-5 423721-07-7 423721-09-9
RL: **DEV (Device component use)**; USES (Uses)
(light-emitting **devices** with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT 313950-73-1P 328238-10-4P 358974-66-0P 377092-02-9P 377092-06-3P 377092-10-9P 422574-56-9P 422574-64-9P 422574-83-2P
RL: **DEV (Device component use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(light-emitting **devices** with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT 62-53-3, Aniline, reactions 95-53-4, o-Toluidine, reactions 104-15-4, p-Toluenesulfonic acid, reactions 108-44-1, m-Toluidine, reactions 578-66-5, 8-Aminoquinoline 586-75-4, 4-Bromobenzoyl chloride 603-35-0, Triphenylphosphine, reactions 769-92-6 876-08-4, 4-Chloromethylbenzoyl

chloride 2039-82-9, 4-Bromostyrene 2156-04-9, 4-Vinylphenylboronic acid 2351-37-3, 4,4'-Biphenyldicarbonyl chloride 3842-55-5, 2-Chloro-4,6-diphenyl-1,3,5-triazine 4422-95-1, 1,3,5-Benzenetricarbonyl trichloride 5470-18-8, 2-Chloro-3-nitropyridine
RL: RCT (Reactant); RACT (Reactant or reagent)
(light-emitting **devices** with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT 34949-41-2P 54696-64-9P 54696-67-2P 78750-58-0P 350025-73-9P 350025-74-0P 377092-01-8P 377092-03-0P 377092-04-1P 377092-05-2P 377092-07-4P 377092-08-5P 422574-55-8P 422574-61-6P 422574-63-8P 422574-79-6P 422574-80-9P 422574-81-0P 422574-82-1P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(light-emitting **devices** with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT 50851-57-5
RL: **DEV (Device component use)**; MOA (Modifier or additive use); USES (Uses)
(polyethylene dioxythiophene doped with; light-emitting **devices** with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT 126213-51-2, Poly(3,4-ethylenedioxythiophene)
RL: **DEV (Device component use)**; USES (Uses)
(polystyrene sulfonate-doped; light-emitting **devices** with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

L46 ANSWER 15 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2002:503505 HCAPLUS
DN 137:70359
TI Organic light-emitting **devices** containing a region or a **mixed layer** provided for lowering energy barriers at interfaces between the organic layers, and electronic **devices** employing the light-emitting **devices**
IN Seo, Satoshi; Yamazaki, Shunpei
PA SEL Semiconductor Energy Laboratory Co., Ltd., Japan
SO Eur. Pat. Appl., 78 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H01L051-20
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74, 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1220339	A2	20020703	EP 2001-130487	20011220
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	US 2002121860	A1	20020905	US 2001-24699	20011221
	JP 2002324680	A2	20021108	JP 2001-395213	20011226
	CN 1362747	A	20020807	CN 2001-130274	20011228
PRAI	JP 2000-400730	A	20001228		
	JP 2001-45847	A	20010221		

AB Light emitting **devices** are described which comprise at least a

first layer comprising a first org. compd.; and a second layer comprising a second org. compd. which is different from the first org. compd., where a region or a **mixed layer** comprising the first org. compd. and the second org. compd. between the first layer and the second layer is provided for lowering energy barriers at interfaces between the org. layers. The **devices** may contain hole-injecting, hole-transporting, electron-transporting, electron-injecting and light-emitting layers as org. compd. layers, and may have more than one regions or **mixed layers**. Electronic **devices** employing the light-emitting **devices** are also discussed.

ST org **electroluminescent device mixed layer** interface energy decrease; electronic **device** OLED **mixed layer** interface energy decrease

IT LUMO (molecular orbital)
(HOMO gap; light-emitting **devices** contg. a region or a **mixed layer** provided for lowering)

IT HOMO (molecular orbital)
(LUMO gap; light-emitting **devices** contg. a region or a **mixed layer** provided for lowering)

IT Chemical chains
(conjugated, hole- or electron-injection regions; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT Polymers, uses
RL: **DEV (Device component use)**; USES (Uses)
(conjugates, hole-injecting region; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT Alkali metal compounds
Lewis bases
RL: **DEV (Device component use)**; MOA (Modifier or additive use); USES (Uses)
(electron-injecting region contg.; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT Lewis acids
RL: **DEV (Device component use)**; MOA (Modifier or additive use); USES (Uses)
(hole-injecting region contg.; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT Halogen compounds
RL: **DEV (Device component use)**; MOA (Modifier or additive use); USES (Uses)
(hole-injecting region of conjugated system doped with; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT Excited triplet state
(light emission from; light-emitting **devices** contg. a region or a **mixed layer** provided for lowering energy barriers at interfaces between org. layers and involving)

IT Electric apparatus
Electroluminescent devices
Electronic **device** fabrication
Interfacial energy
Optical imaging **devices**
(light-emitting **devices** contg. a region or a **mixed layer** provided for lowering energy barriers at interfaces

between org. layers, and electronic **devices** employing light-emitting **devices**)

IT 7439-93-2, Lithium, uses
RL: **DEV (Device component use)**; MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(-doped **bathophenanthroline** electron-injection region; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT 50926-11-9, ITO
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(anode; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT 7429-90-5, Aluminum, uses 11099-20-0 12798-95-7
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(cathode; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT 18115-70-3, Lithium acetyl acetonate, uses
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(electron-injection layer; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT **1662-01-7, Bathophenanthroline** 2085-33-8, Alq3
150405-69-9, TAZ (**triazole** derivative)
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(electron-transporting layer; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT **4733-39-5**, Bathocuproine
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(hole-blocking layer; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT **147-14-8**, Copper phthalocyanine
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(hole-injection material; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT 123847-85-8, 4,4'-Bis[N-(1-naphthyl)-N-phenylamino]biphenyl 124729-98-2, 4,4',4''-Tris [N-(3-methylphenyl)-N-phenylamino]triphenylamine
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(hole-transporting layer; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT 189363-47-1
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(hole-transporting layer; fabrication of light-emitting **devices**

contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg. spiro-TAD)

IT 104934-50-1, Poly(3-hexyl)thiophene
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(iodine-doped hole-injecting region; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT 58328-31-7, 4,4'-N,N'-Dicarbazolylbiphenyl
RL: **DEV (Device component use)**; MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(light-emitting layer dopant; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT 296269-66-4
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(light-emitting layer; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT 146162-54-1
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(light-emitting material host; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT 51325-91-8, 4-(Dicyanomethylene)-2-methyl-6-(p-dimethylaminostyryl)-4H-pyran 94928-86-6, Tris (2-phenylpyridine) iridium
RL: **DEV (Device component use)**; MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(light-emitting material; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

IT 14362-44-8, Iodine, atomic, uses
RL: **DEV (Device component use)**; MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(polymer hole-injecting region doped with; fabrication of light-emitting **devices** contg. **mixed layer** lowering energy barriers at interfaces between org. layers and contg.)

L46 ANSWER 16 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2002:66774 HCAPLUS
DN 136:126314
TI **Luminescence device**
IN Tsuboyama, Akira; Okada, Shinjiro; Takiguchi, Takao; Moriyama, Takashi; Kamatani, Jun
PA Canon Kabushiki Kaisha, Japan
SO Eur. Pat. Appl., 16 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H05B033-14
ICS H01L051-20; C09K019-54
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 75, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1175129	A1	20020123	EP 2001-117367	20010718
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2002043056	A2	20020208	JP 2000-218321	20000719
	US 2002038860	A1	20020404	US 2001-904505	20010716
PRAI	JP 2000-218321	A	20000719		

AB **Electroluminescent devices** are described which comprise a pair of electrodes sandwiching an active **layer** comprising a **mixt**. of a liq. crystal compd. with a phosphorescent compd. The liq. crystal compd. may have a discotic phase or a smectic phase; the phosphorescent compd. preferably has a planar mol. skeleton. The liq. crystal may also be phosphorescent. The liq. crystals aid carrier transport.

ST **electroluminescent device** phosphorescent compd liq crystal host

IT Liquid crystals
(discotic; **electroluminescent devices** using phosphorescent compds. in liq. crystal hosts)

IT **Electroluminescent devices**
Liquid crystals
Phosphorescent substances
(**electroluminescent devices** using phosphorescent compds. in liq. crystal hosts)

IT Liquid crystals
(smectic; **electroluminescent devices** using phosphorescent compds. in liq. crystal hosts)

IT 2085-33-8, Tris(8-hydroxyquinolinato)aluminum **4733-39-5**, 2,9-Dimethyl-4,7-diphenyl-1,10-**phenanthroline** 7429-90-5, Aluminum, uses 31248-39-2, Platinum octaethylporphyrin 50926-11-9, Indium tin oxide 70351-86-9 94928-86-6 123847-85-8, .alpha.-NPD 219683-04-2
RL: **DEV (Device component use)**; USES (Uses)
(**electroluminescent devices** using phosphorescent compds. in liq. crystal hosts)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Dainippon Printing Co Ltd; EP 0864631 A 1998 HCAPLUS
(2) Dainippon Printing Co Ltd; EP 0915144 A 1999 HCAPLUS
(3) Dainippon Printing Co Ltd; JP 2000068052 A 2000 HCAPLUS
(4) Funada, F; US 4556287 A 1985
(5) Gen Electric Co Plc; EP 0186970 A 1986 HCAPLUS
(6) Merck Patent Gmbh; DE 19809944 A 1998 HCAPLUS

L46 ANSWER 17 OF 69 WPIX (C) 2003 THOMSON DERWENT

AN 2003-167497 [16] WPIX

DNN N2003-132304 DNC C2003-043617

TI **Electroluminescent device** for transmission of signals down optic fibers, comprises electrodes and **electroluminescent** layer comprising layer of light emitting metal compound chosen from organic complexes.

DC A85 E12 L03 U11 U12 U14 V07 X26

IN KATHIRGAMANATHAN, P

PA (ELAM-N) ELAM-T LTD

CYC 100

PI WO 2002102924 A2 20021227 (200316)* EN 27p C09K011-06
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZM ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VN YU ZA ZM ZW
ADT WO 2002102924 A2 WO 2002-GB2722 20020614
PRAI GB 2001-28118 20011123; GB 2001-14710 20010615
IC ICM C09K011-06
ICS H01L051-20; H05B033-14
AB WO2002102924 A UPAB: 20030307
NOVELTY - The **electroluminescent device** comprises an electrode (I), an **electroluminescent** layer and an electrode (II). The **electroluminescent** layer comprises a layer of light emitting metal compound chosen from organic complexes of preset formula.
DETAILED DESCRIPTION - The **electroluminescent device** comprises an electrode (I), an **electroluminescent** layer and an electrode (II). The **electroluminescent** layer comprises a layer of light emitting metal compound chosen from organic complexes of formula (M)n+m(L alpha)n(L1)m where:
M = non-rare earth metal;
n+m = valency state of M;
m = 0 or greater;
L alpha = an organic ligand; and
L1 = a charged organic ligand.
An INDEPENDENT CLAIM is included for compounds of formulae (A) and (B):
R3 = H, alkyl group or R4O; and
R4 = alkyl group.
USE - For transmission of signals down optic fibers and display applications, such as liquid crystal **devices**.
ADVANTAGE - The **electroluminescent device** prevents electrons from moving into the electrodes without recombining with the holes, using the hole transmitting layer. The **electroluminescent device** generates electromagnetic radiation in the near infrared region of the spectrum. The **electroluminescent device** has favorable **luminescence** and current efficiency.
Dwg.0/25
FS CPI EPI
FA AB; GI; DCN
MC CPI: A12-E11; A12-L03A; A12-L03B; E23-B; E24; E24-A05; L03-D01D; L03-G05F
EPI: U11-A15A; U12-A01C; U14-J; V07-G10C; X26-J

L46 ANSWER 18 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 2002-548023 [58] WPIX
DNN N2002-433830 DNC C2002-155472
TI Organic **electroluminescent** element for displays, has pair of electrodes and organic **electroluminescent** medium **layer** between electrodes including **mixture layer** of positive hole transporting compound and electron transporting compound.
DC E19 L03 U11 U14 X26
IN ARAKANE, T; FUKUOKA, K; HOSOKAWA, C
PA (IDEK) IDEMITSU KOSAN CO LTD
CYC 24
PI WO 2002052904 A1 20020704 (200258)* JA 48p H05B033-14

RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
W: CN IN KR
US 2002098379 A1 20020725 (200258) H05B033-14
JP 2002198183 A 20020712 (200261) 18p H05B033-22
ADT WO 2002052904 A1 WO 2001-JP10789 20011210; US 2002098379 A1 US 2001-25634 20011226; JP 2002198183 A JP 2000-394152 20001226
PRAI JP 2000-394152 20001226
IC ICM H05B033-14; H05B033-22
ICS C09K011-06; H05B033-26
AB WO 200252904 A UPAB: 20020910
NOVELTY - Organic **electroluminescent** element has a pair of electrodes and an organic **electroluminescent** medium layer between the electrodes. This **layer** has a **mixture layer** containing:
(A) at least 1 positive hole transporting compound; and
(B) at least 1 electron transporting compound.
The weight ratio of (A):(B) is 8:92 - 92:8. The energy gap Eg1 of (A) is larger than the energy gap Eg2 of (B).
USE - Used as an organic **electroluminescent** element for e.g. displays of information machines.
ADVANTAGE - Electrons and positive holes are recombined in the organic **electroluminescent** medium layer and light is emitted. The **electroluminescent device** has a long service life and emits light with high efficiency.
Dwg.0/0
FS CPI EPI
FA AB; GI; DCN
MC CPI: E05-A; E05-B; E05-B03; E05-D; E05-F; E05-L; E05-M; E05-N; E05-P; E06-D02; E06-H; E07-H; E08-A; E10-B01A; L03-D01D; L03-G05F
EPI: U11-A15; U14-J02; X26-J

L46 ANSWER 19 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 2003-015844 [01] WPIX
DNN N2003-011783 DNC C2003-003803
TI **Electroluminescent device** for full color display, includes polymer structure comprising hole transfer polymer contacting an anode and n-type conjugated polymer contacting a cathode.
DC A85 L03 P85 T04 U14
IN JENEKHE, S A; ZHANG, X
PA (JENE-I) JENEKHE S A; (ZHAN-I) ZHANG X
CYC 1
PI US 2002097001 A1 20020725 (200301)* 38p G09G003-10
ADT US 2002097001 A1 Provisional US 2000-179096P 20000131, US 2001-774901 20010131
PRAI US 2000-179096P 20000131; US 2001-774901 20010131
IC ICM G09G003-10
AB US2002097001 A UPAB: 20030101
NOVELTY - An **electroluminescent device** comprises a multi-layered polymer structure between an anode and a cathode. The polymer structure comprises a first polymer containing a hole transfer polymer contacting the anode and a second polymer layer containing an n-type conjugated polymer contacting the cathode.
DETAILED DESCRIPTION - An **electroluminescent device** comprises an anode and a cathode electrically connected to a power supply and a voltage regulator, and a multi-layered polymer structure between the anode and cathode. The polymer structure comprises a first polymer containing a hole transfer polymer contacting the anode and a second polymer layer containing an n-type conjugated polymer contacting the

cathode. Changes in the voltage of current passing through the **electroluminescent device** change the color of **electroluminescent** emissions from the polymer structure.

INDEPENDENT CLAIMS are included for the following:

(1) A full color display comprising pixels containing the inventive **electroluminescent device**;and

(2) A method of making a multi-color **electroluminescent device**.

USE - For a full color display.

ADVANTAGE - The invention defines criteria for structural assembly and selection of compatible polymers for multi-color **electroluminescent devices**. It can emit multicolor light in response to the voltage of electrical current.

DESCRIPTION OF DRAWING(S) - The figure shows the multi-layered **electroluminescent device**.

Dwg.2A/17

FS CPI EPI GMPI

FA AB; GI

MC CPI: A12-E11C; L03-G05F

EPI: T04-H03B; T04-H03C3; U14-J02D2

L46 ANSWER 20 OF 69 WPIX (C) 2003 THOMSON DERWENT

AN 2002-749515 [81] WPIX

DNN N2002-590205 DNC C2002-212443

TI **Luminescent device** for electric appliance, featuring organic **luminescent** element having anode, cathode and organic compound layer comprising high-molecular **compound**(s), and **mixed** region located apart from anode and cathode.

DC A89 E14 L03 P85 U11 U14 W01 W04

IN SEO, S; YAMAZAKI, S

PA (SEME) SEMICONDUCTOR ENERGY LAB; (SEOS-I) SEO S; (YAMA-I) YAMAZAKI S

CYC 3

PI US 2002093283 A1 20020718 (200281)* 35p H05B033-14

JP 2002289352 A 20021004 (200281) 24p H05B033-14

CN 1366354 A 20020828 (200282) H01L033-00

ADT US 2002093283 A1 US 2002-43786 20020110; JP 2002289352 A JP 2002-9296 20020117; CN 1366354 A CN 2002-101695 20020117

PRAI JP 2001-9544 20010117

IC ICM H01L033-00; H05B033-14

ICS C09K011-06; G09F009-00; G09F009-30; H05B033-00; H05B033-10; H05B033-22

AB US2002093283 A UPAB: 20030224

NOVELTY - A **luminescent device** features an organic **luminescent** element having organic compound layer interposed between anode and cathode. The layer contains compounds chosen from hole injection, electron injection, hole transport, electron transport, blocking and **luminescent** compounds, with at least one being a high-molecular **compound**. A **mixed** region in which the **compounds** are **mixed** is located apart from anode and cathode.

DETAILED DESCRIPTION - A **luminescent device** has an organic **luminescent** element comprising an anode, a cathode and an organic compound layer interposed between the anode and the cathode. The layer comprises at least two compounds chosen from a hole injection compound which receives holes from the anode, an electron injection compound which receives electron from the cathode, a hole transport compound, an electron transport compound, a blocking compound and a **luminescent** compound which demonstrates light emission. At

least one of the two compounds is a high-molecular **compound**. A **mixed** region in which the **compounds** are **mixed** is located apart from the anode and the cathode.

An INDEPENDENT CLAIM is included for the manufacture of **luminescent device**, which involves wet-supplying solution (I) over a substrate having an electrode, heating solution (I) in a treating atmosphere at a temperature and disposing solution (II) over the substrate. Solution (I) comprises organic compound (I) and solvent (I). The pressure of the treating atmosphere is higher than the vapor pressure of solvent (I) at that temperature.

USE - As display **devices** for electrical appliances, such as video cameras, digital cameras, CD players, games machines, mobile computers, personal computers, cellular phones, car audio and home audio systems.

ADVANTAGE - The **luminescent device** consumes less power and is durable. The energy barrier present in the organic compound layer is relaxed and the mobility of carriers is enhanced by eliminating an interface in the organic compound layer. As a continuous junction disc is formed, it is possible to prepare an organic **luminescent** element which does not show an obvious laminated structure and which ensures functional realization. The carrier recombination efficiency and **luminescent** efficiency are enhanced. The continuous junction region enables notable observation of change in concentration. The **luminescent device** is compact, lightweight and self-luminous and hence eliminates the need for back-lighting of the electrical appliances. The **luminescent device** provides better visibility and a wide viewing angle.

Since the organic **luminescent** element has very fast response speed, the **luminescent device** is suitable for the display of animations.

Dwg.0/19

FS CPI EPI GMPI
FA AB; DCN
MC CPI: A08-S02; A11-B05D; A12-E11C; A99-A; E05-B03; E05-N; E06-D15; E07-D13C; E07-E01; E10-B01A4; L03-G05F; L03-H04A
EPI: U11-A15B; U14-J02A; U14-J02D2; W01-C01B3E; W01-C01D3C; W04-C10A1; W04-J03A; W04-M01D3A; W04-X02C

L46 ANSWER 21 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 2003-214318 [21] WPIX
DNN N2003-170961 DNC C2003-054974
TI Organic **electroluminescent device**, useful for a highly bright full color display, has organic layer consisting of at least one mixed ligand complex.
DC E19 L03 U11 U14
PA (SONY) SONY CORP
CYC 1
PI JP 2002334787 A 20021122 (200321)* 17p H05B033-14
ADT JP 2002334787 A JP 2001-150376 20010521
PRAI JP 2001-66390 20010309
IC ICM H05B033-14
ICS C09K011-06; H05B033-22
AB JP2002334787 A UPAB: 20030328
NOVELTY - An organic **electroluminescent device** has an organic layer having a light emitting region between an anode and a cathode. At least part of the organic layer consists of at least one mixed ligand complex.

DETAILED DESCRIPTION - An organic **electroluminescent**

device has an organic layer having a light emitting region between an anode and a cathode. At least part of the organic layer consists of at least one mixed ligand complex of formula (I).

ring A = alpha -diimine residue comprising 1,10-**phenanthroline** derivative of formula (i), a 2,2'-bipyridine derivative of formula (ii), a 2,2'-biquinoline derivative of formula (iii) or a 2,2'-bipyrazine derivative of formula (iv);

R1, R2 = alkyl, halo, ether, oxyalkyl, carboxyl, carboxylate ester, nitro, phenyl, or benzyl;

m, n = 0 or higher;

ring B = aromatic dithiolate residue comprising benzene-dithiol derivative of formula (v), naphthalene-dithiol derivative of formula (vi), anthracene-dithiol derivative of formula (vii), naphthalene-dithiol derivative of formula (viii) or anthracene-dithiol derivative of formula (ix);

R3, R4 = alkyl, halo, ether, oxyalkyl, carboxyl, carboxylate ester, nitro, phenyl, or benzyl;

m', n' = 0 or higher;

M = d8 transition metal ion.

USE - The organic **electroluminescent device** is used for a highly bright full color display.

ADVANTAGE - The organic **electroluminescent device** has high brightness, stable light emission, and superior electrical, thermal, or chemical stability.

Dwg.0/9

FS CPI EPI
FA AB; GI; DCN
MC CPI: E05-N; L03-D01D; L03-G05F
EPI: U11-A15B; U14-J02D2

L46 ANSWER 22 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 2003-214317 [21] WPIX
DNN N2003-170960 DNC C2003-054973
TI Organic **electroluminescent device**, useful for highly bright full color display, has organic layer consists of at least one mixed ligand complex.
DC E19 L03 U11 U14
PA (SONY) SONY CORP
CYC 1
PI JP 2002334786 A 20021122 (200321)* 16p H05B033-14
ADT JP 2002334786 A JP 2001-150375 20010521
PRAI JP 2001-66386 20010309
IC ICM H05B033-14
ICS C09K011-06; H05B033-22
AB JP2002334786 A UPAB: 20030328

NOVELTY - An organic **electroluminescent device** has an organic layer having a light emitting region between an anode and a cathode. At least part of the organic layer consists of at least one mixed ligand complex.

DETAILED DESCRIPTION - An organic **electroluminescent device** has an organic layer having a light emitting region between an anode and a cathode. At least part of the organic layer consists of at least one mixed ligand complex of formula (I).

ring A = alpha -diimine residue comprising 1,10-**phenanthroline** derivative of formula (i), 2,2'-bipyridine derivative of formula (ii), or 2,2'-bipyridine derivative of formula (iii);

R1, R2 = alkyl, halo, ether, oxyalkyl, carboxyl, carboxylate ester,

nitro, phenyl, or benzyl;
m, n = 0 or higher;
Ring B = aromatic dithiolate residue comprising benzene-dithiol derivative of formula (iv), naphthalene-dithiol derivative of formula (v), an anthracene-dithiol derivative of formula (vi), naphthalene-dithiol derivative of formula (vii) or an anthracene-dithiol derivative of formula (vii);
R3, R4 = alkyl, halo, ether, oxyalkyl, carboxyl, carboxylate ester, nitro, phenyl, or benzyl;
m', n' = 0 or higher; and
M = d10 transition metal ion.
USE - The organic **electroluminescent device** is used for a highly bright full color display.
ADVANTAGE - The organic **electroluminescent device** has high brightness, stable light emission, and superior electrical, thermal or chemical stability.
Dwg.0/9

FS CPI EPI
FA AB; GI; DCN
MC CPI: E05-L03D; L03-D01D; L03-G05F
EPI: U11-A15B; U14-J01; U14-J02D2

L46 ANSWER 23 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 2002-593365 [64] WPIX
DNN N2002-470962 DNC C2002-167894
TI Organic **electroluminescent** element for flat panel displays, has anode, light emitting layer, electron carrying layer containing dopant with electron mobility higher than host, cathode formed sequentially on substrate.
DC A89 E13 L03 S06 U12 U14 W05 X22 X26
PA (MITU) MITSUBISHI CHEM CORP
CYC 1
PI JP 2002100479 A 20020405 (200264)* 16p H05B033-22
ADT JP 2002100479 A JP 2000-292478 20000926
PRAI JP 2000-292478 20000926
IC ICM H05B033-22
ICS C09K011-06; H05B033-14
AB JP2002100479 A UPAB: 20021007
NOVELTY - An organic **electroluminescent** element has anode (2), light emitting layer (5), electron carrying layer (7) and cathode (8) forms sequentially in a substrate (1). Electron carrying layer contains host material with molecular weight of 400 or more and dopant material with molecular weight **less** than 400. The **electron mobility** of dopant material is higher than electron mobility of host material.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for manufacturing method of organic **electroluminescent** element.
USE - Used for flat panel displays, office automation computers, televisions, vehicle mounted outdoor type display, multicolor display **device**, light source of copier, back light light source of liquid crystal display or measuring instruments, display boards and marker lamps.
ADVANTAGE - Electric charge injection balance is favorable and **electroluminescent** element provides high efficiency light emission since the electron carrying layer has favorable film quality.
DESCRIPTION OF DRAWING(S) - The figure shows typical sectional drawing of organo **electroluminescent** element. (Drawing includes non-English language text).
Substrate 1

Anode 2
Hole carrying layer 4
Light emitting layer 5
Hole blocking layer 6
Electron carrying layer 7
Cathode layer 8
Dwg.1/2
FS CPI EPI
FA AB; GI; DCN
MC CPI: A08-M09A; A09-A03A; A12-E11C; E05-B03; E05-D; E05-L03D; E06-D06; E06-D13; E10-B01A4; E23-B; E24-A04A; E24-A04C; E35-F; E35-H; L03-G05F
EPI: S06-A03E1; U12-B03C; U14-J02D2; U14-K01A4C; W05-E05B1; X22-B05; X26-J

L46 ANSWER 24 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 2002-621575 [67] WPIX
DNN N2002-492054 DNC C2002-175737
TI Organic **electroluminescent** element for image display **device**, has organic compound containing hole transport property high molecular compound and **phenanthroline** ligand of rare earth complex coupled via methylene chain.
DC A17 E13 U11 U12 U14 X26
PA (KYOC) KYOCERA CORP
CYC 1
PI JP 2002100474 A 20020405 (200267)* 5p H05B033-14
ADT JP 2002100474 A JP 2000-291098 20000925
PRAI JP 2000-291098 20000925
IC ICM H05B033-14
ICS C08K005-353; C08L039-04; C09K011-06; H05B033-22
AB JP2002100474 A UPAB: 20021018
NOVELTY - An organic **electroluminescent** element has an organic **compound** containing a **mixture** of hole transport property high molecular compound, a light emitting rare earth complex which has **phenanthroline** as ligand and an electron transport low molecular compound. The hole transport property high molecular compound and **phenanthroline** ligand of rare earth complex are coupled through a methylene chain.
DETAILED DESCRIPTION - An organic **electroluminescent** element has an organic compound layer (3) clamped between a transparent electrode (2) and a metal electrode (5). The organic **compound** contains a **mixture** of hole transport property high molecular compound, a light emitting rare earth complex which has **phenanthroline** as ligand and an electron transport low molecular compound. The hole transport property high molecular compound and **phenanthroline** ligand of rare earth complex are coupled through a methylene chain (CH2)n, where n is arbitrary natural number.
USE - For light emitting diode array mounted on image display **devices**, illuminators, printers and copiers.
ADVANTAGE - The tendency of blocking effect of **phenanthroline** ligand with respect to hole oriented close to hole transport property high molecular compound is strong. Therefore, though the current density is high, the direct injection of hole conveyed through a hole transport property high molecular compound is inhibited by light emitting rare earth complex. The organic **electroluminescent** element has excellent brightness, high quality and high performance.
DESCRIPTION OF DRAWING(S) - The figure shows outline sectional view of organic **electroluminescent** element. (Drawing includes non-English language text).
Glass substrate 1

Transparent electrode 2
Organic compound layer 3
Electronic injection layer 4
Metal electrode 5
Dwg.1/1
FS CPI EPI
FA AB; GI; DCN
MC CPI: A12-E11C; E05-P; E05-S; E06-D15
EPI: U11-A15B; U12-A01A6; U14-J02D2; X26-J

L46 ANSWER 25 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 2003-048346 [05] WPIX
DNN N2003-038060 DNC C2003-012570
TI Preparation of nanoparticle dispersion of zinc sulfide doped with manganese ions, used for an **electroluminescent device**, involves performing precipitation by mixing appropriate aqueous solutions that contain **triazole** or diazole compounds.
DC A13 A26 A85 E13 L03 U11 U12
IN ANDRIESSEN, H; LEZY, S
PA (GEVA) AGFA-GEVAERT; (GEVA) AGFA-GEVAERT NV; (ANDR-I) ANDRIESSEN H; (LEZY-I) LEZY S
CYC 28
PI EP 1241713 A1 20020918 (200305)* EN 14p H01L033-00
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR
JP 2002322468 A 20021108 (200305) 10p C09K011-02
US 2002149025 A1 20021017 (200305) H01L033-00
ADT EP 1241713 A1 EP 2001-8 20010207; JP 2002322468 A JP 2002-28113 20020205; US 2002149025 A1 Provisional US 2001-271308P 20010223, US 2002-54014 20020124
PRAI EP 2001-8 20010207
IC ICM C09K011-02; H01L033-00
ICS C01G009-08; C09K011-00; C09K011-56; C09K011-57; H01J001-62; H01J063-04; H05B033-26
ICA H05B033-10; H05B033-14
AB EP 1241713 A UPAB: 20030121
NOVELTY - A nanoparticle dispersion of zinc sulfide doped with manganese ions is prepared by performing a precipitation by mixing appropriate aqueous solutions of zinc, sulfide and manganese ions. The aqueous solution(s) further contains a **triazole** or a diazole compound.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for a thin film inorganic light emitting diode, comprising:

(i) a first conductive electrode;

(ii) a coated **layer** having a **mixture** of a nanoparticle dispersion of zinc sulfide doped with manganese ions (ZnS:Mn) and a p-type semiconductor, or a coated double layer assemblage having one layer containing a nanoparticle dispersion of ZnS:Mn and another layer containing a p-type semiconductor; and

(iii) a second conductive electrode.

At least one of the first and second electrodes is transparent.

USE - The inventive process is used for preparing a nanoparticle dispersion of zinc sulfide doped with manganese ions. The prepared nanoparticle dispersion is used for an **electroluminescent device**.

ADVANTAGE - The process is easy and economical, and provides a nanoparticle dispersion of zinc sulfide doped in a very efficient way with manganese ions.

DESCRIPTION OF DRAWING(S) - The figure shows a view of an inorganic

light emitting diode illustrating the layer arrangement.
Dwg.1A/2
FS CPI EPI
FA AB; GI; DCN
MC CPI: A12-E11C; E06-D05; E06-D08; E06-D09; E07-B01; E07-D08; E07-D09; E07-D13C; E35-C; E35-S; L04-A03A; L04-C02
EPI: U11-A15; U12-A01A1B; U12-A01A1X; U12-A01A2; U12-B03B

L46 ANSWER 26 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2002:686034 HCAPLUS
DN 138:46898
TI Fuzzy-junction organic light-emitting **devices**
AU Chen, C.-W.; Cho, T.-Y.; Wu, C.-C.; Yu, H.-L.; Luh, T.-Y.
CS Graduate Institute of Electro-Optical Engineering, Department of Electrical Engineering, and Graduate Institute of Electronics Engineering, National Taiwan University, Taichung, 10617, Taiwan
SO Applied Physics Letters (2002), 81(9), 1570-1572
CODEN: APPLAB; ISSN: 0003-6951
PB American Institute of Physics
DT Journal
LA English
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
AB A fuzzy-junction org. light-emitting **device** (OLED) contg. a graded org.-org. interface is reported. Such graded junction is effectively produced using interdiffusion through an ultrathin interfacial fusing layer sandwiched between two functional layers. With a glass transition temp. (Tg) lower than remaining layers, this fusing layer permits smooth interdiffusion and **mixing** of neighboring **layers** by annealing above its Tg. With appropriate material combinations, fuzzy-junction OLEDs thus prepd. exhibit both reduced voltage and enhanced emission efficiency in comparison with conventional abrupt-junction **devices**. As an instance, a green fluorescent OLED with such fuzzy junction shows a high peak power efficiency of .apprx.20 lm/W, substantially .gtorsim.14 lm/W of a corresponding abrupt-junction **device**.
ST fuzzy junction org light emitting diode **electroluminescent** LED
IT **Electroluminescent devices**
(fuzzy-junction org. light-emitting **devices**)
IT Diffusion
(interdiffusion; fuzzy-junction org. light-emitting **devices**)
IT 384341-27-9
RL: **DEV (Device component use)**; PRP (Properties); USES (Uses)
(DPSVB; fuzzy-junction org. light-emitting **devices**)
IT 292827-46-4
RL: **DEV (Device component use)**; PRP (Properties); USES (Uses)
(TATE; fuzzy-junction org. light-emitting **devices**)
IT 7429-90-5, Aluminum, uses 7789-24-4, Lithium fluoride, uses 50926-11-9, Indium tin oxide
RL: **DEV (Device component use)**; USES (Uses)
(fuzzy-junction org. light-emitting **devices**)
IT 2085-33-8, Aluminum tris(8-hydroxyquinolinato) **4733-39-5**, BCP 9003-53-6, Polystyrene 123847-85-8, .alpha.-NPD 126213-51-2, Polyethylenedioxythiophene
RL: **DEV (Device component use)**; PRP (Properties); USES (Uses)
(fuzzy-junction org. light-emitting **devices**)
RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
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(13) Wu, C; Appl Phys Lett 2001, V79, P3023 HCAPLUS

L46 ANSWER 27 OF 69 INSPEC COPYRIGHT 2003 IEE
AN 2002:7443008 INSPEC DN B2002-12-4260-014
TI Doping in the **mixed layer** to achieve high brightness and efficiency organic light emitting **devices**.
AU Gao Wen-Bao; Yang Kai-Xia; Liu Hong-Yu; Feng Jing; Liu Shi-Yong (Nat. Lab. of Integrated Optoelectron., Jilin Univ., Changchun, China)
SO Chinese Physics Letters (Sept. 2002) vol.19, no.9, p.1362-4. 13 refs.
Published by: Chinese Phys. Soc
CODEN: CPLEEU ISSN: 0256-307X
SICI: 0256-307X(200209)19:9L.1362:DMLA;1-6
DT Journal
TC Practical; Experimental
CY China
LA English
AB Doping in the **mixed layer** was introduced to fabricate high brightness and high efficiency organic light emitting **devices**. In these **devices**, a copper **phthalocyanine** (CuPc) film acts as the buffer layer, a naphthylphenybiphenyl amine (NPB) film as the hole transport layer and a tris(8-hydroxyquinolinolate)aluminium (Alq3) film as the electron transport layer. The **luminescent layer** consists of the **mixture** of NPB, Alq3 (to be called the **mixed layer**), and an emitting dopant 5,6,11,12-petraphenylnaphthacene (rubrene), where the concentration of NPB declined and the concentration of Alq3 was increased gradually in the deposition process. Adopting this doping **mixed layer**, the **device** exhibits the maximum emission of 49300 cd/m2 at 35 V and the maximum efficiency of 7.96 cd/A at 10.5 V, which have been improved by two times in comparison with conventional doped **devices**. We attribute this improvement to the effective confinement of carriers in the **mixed layer**, which leads to the increase of the recombination efficiency of carriers.
CC B4260 Electroluminescent devices
CT BRIGHTNESS; **ELECTROLUMINESCENT DEVICES**; ELECTRON-HOLE RECOMBINATION; ORGANIC COMPOUNDS
ST **mixed layer doping**; brightness; **organic light emitting devices**; **copper phthalocyanine film**; naphthylphenybiphenyl amine film; hole transport layer; tris(8-hydroxyquinolinolate)aluminium film; electron transport layer; 5,6,11,12-petraphenyinaphthacene; rubrene; carrier confinement; recombination efficiency

L46 ANSWER 28 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2002:92312 HCAPLUS
DN 136:408640
TI Graded **mixed-layer** organic light-emitting

devices
AU Chwang, Anna B.; Kwong, Raymond C.; Brown, Julie J.
CS Universal Display Corporation, Ewing, NJ, 08618, USA
SO Applied Physics Letters (2002), 80(5), 725-727
CODEN: APPLAB; ISSN: 0003-6951
PB American Institute of Physics
DT Journal
LA English
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 22, 76
AB The performance of graded, **mixed-layer** org. LEDs (OLEDs) is described. The **devices** are step graded from a mostly hole transporting layer (HTL) to a mostly electron transporting layer (ETL) from anode side to cathode side, resp. Luminous efficiencies of >4.5 lm/W and 10 cd/A are obtained at 1000 cd/m2 for green, electrofluorescent, graded mixed OLEDs. These efficiencies are significantly higher than those of a uniformly mixed **device**, i.e., a **device** in which the HTL and ETL are uniformly mixed, but lower than those of a conventional heterostructure **device** employing the same dopant material. The operating lifetime of the graded mixed OLEDs is much improved over the heterostructure **device**. The graded mixed OLED **device** structure represents a path to achieving extended lifetimes with sufficient efficiency for flat panel display applications in which this parameter is crit. to market acceptance.
ST graded **mixed layer** org LED
IT Electric conductors
(electron transporting **layer**; graded **mixed-layer** org. LEDs contg.)
IT **Electroluminescent devices**
(graded **mixed-layer** org. LEDs)
IT Optical imaging **devices**
(graded **mixed-layer** org. LEDs for flat panel displays)
IT Electric conductors
(hole transporting **layer**; graded **mixed-layer** org. LEDs contg.)
IT 155306-71-1, C 545T
RL: **DEV (Device component use)**; USES (Uses)
(C 545T; graded **mixed-layer** org. LEDs contg.)
IT **147-14-8**, Copper phthalocyanine 2085-33-8, Tris(8-hydroxyquinolinato)aluminum 7429-90-5, Aluminum, uses 7789-24-4, Lithium fluoride, uses 94928-86-6, fac-Tris(2-phenylpyridine)iridium 123847-85-8, .alpha.-NPD
RL: **DEV (Device component use)**; USES (Uses)
(graded **mixed-layer** org. LEDs contg.)
RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L46 ANSWER 29 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2002:578141 HCAPLUS
DN 137:270098
TI White light emission obtained by direct color **mixing** in multi-**layer** organic light-emitting **devices**
AU Lee, Sung Soo; Cho, Sung Min
CS Department of Chemical Engineering, Sungkyunkwan University, Suwon, 440-746, S. Korea
SO Korean Journal of Chemical Engineering (2002), 19(3), 463-466
CODEN: KJCHE6; ISSN: 0256-1115
PB Korean Institute of Chemical Engineers
DT Journal
LA English
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
AB Three different structures of multi-layer org. light-emitting **devices**, which consisted of two emitting layers sepd. by a carrier blocking layer, were studied. Since the emitting layers are constructed to emit different colors, the colors emitted from the structures are mixed. The colors were directly mixed in the structures of this study due to the carrier blocking layer sandwiched by the two emissive layers. The blocking layer splits the carrier recombination zone, and with the emission color is controlled by balancing the split. For the white light the CIE coordinate of (0.30, 0.33) was obtained at an applied voltage of 14 V. The luminance is 1,000 cd/m2 at 14 V with the power efficiency of 0.4 lm/W. For a luminance of 100 cd/m2 at 11 V, the CIE coordinate is (0.31, 0.34) and the power efficiency was .ltoreq.0.53 lm/W.
ST white light emission color mixing multilayer org LED; recombination zone splitting light emitting diode
IT Band structure
(diagram; white light emission obtained by direct color **mixing** in multi-**layer** org. light-emitting **devices**)
IT Electric current carriers
(recombination, zone splitting for; white light emission obtained by direct color **mixing** in multi-**layer** org. light-emitting **devices**)
IT **Electroluminescent devices**
HOMO (molecular orbital)
LUMO (molecular orbital)
Luminescence, electroluminescence
(white light emission obtained by direct color **mixing** in multi-**layer** org. light-emitting **devices**)
IT **Luminescence**
(white; white light emission obtained by direct color **mixing** in multi-**layer** org. light-emitting **devices**)
IT 12798-95-7
RL: **DEV (Device component use)**; USES (Uses)
(white light emission obtained by direct color **mixing** in multi-**layer** org. light-emitting **devices**)
IT **147-14-8**, Copper phthalocyanine 517-51-1, Rubrene 2085-33-8, Aluminum tris(8-hydroxyquinolinato) 50926-11-9, Indium tin oxide 51325-95-2, DCM2 123847-85-8, .alpha.-NPD 142289-08-5, DPVBi
RL: **DEV (Device component use)**; PRP (Properties); USES (Uses)

(white light emission obtained by direct color **mixing** in multi-**layer** org. light-emitting **devices**)

RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L46 ANSWER 30 OF 69 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:326177 HCAPLUS

DN 137:101078

TI Single layer polymer **electroluminescent devices** incorporating new electron transport materials

AU Cea, P.; Hua, Y.; Pearson, C.; Wang, C.; Bryce, M. R.; Royo, F. M.; Petty, M. C.

CS University of Durham, School of Engineering and Centre for Molecular and Nanoscale Electronics, Durham, DH1 3LE, UK

SO Thin Solid Films (2002), 408(1-2), 275-281
CODEN: THSFAP; ISSN: 0040-6090

PB Elsevier Science B.V.

DT Journal

LA English

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 38, 76

AB The opto-electronic properties of single layer light emitting **devices** contg. the polymer poly[2-(2-ethylhexyloxy)-5-methoxy-1,4-phenylenevinylene] and different electron transport materials are reported. Two **oxadiazole** derivs. and three **oxadiazoles** contg. a pyridine unit have been used as electron transport materials. The effects of layer thickness and annealing on the **device** efficiencies are described. An external quantum efficiency of 0.1% was obtained for a 255-nm-thick **device** incorporating 20% of 3,5-bis[2-(4-tert-butylphenyl)-1,3,4-**oxadiazol**-5-yl]pyridine.

ST single **mixed layer** polymer **electroluminescent device** electron transport material; MEHPPV PLED **oxadiazole** deriv pyridine electron transport material **electroluminescence**

IT Annealing
(effect on **electroluminescence**; single **mixed layer** polymer **electroluminescent devices** incorporating new electron transport materials)

IT Electric conductors
(electron transport materials; single **mixed layer** polymer **electroluminescent devices** incorporating new electron transport materials)

IT Electric current-potential relationship
Electron transport
(single **mixed layer** polymer

electroluminescent devices incorporating new electron transport materials)

IT **Electroluminescent devices**
(single **mixed layer**; single **mixed layer** polymer **electroluminescent devices** incorporating new electron transport materials)

IT Size effect
Thickness
(thickness effect, layer thickness effect on **device** efficiency; single **mixed layer** polymer **electroluminescent devices** incorporating new electron transport materials)

IT **Luminescence, electroluminescence**
(visible; single **mixed layer** polymer **electroluminescent devices** incorporating new electron transport materials)

IT 50926-11-9, ITO
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(anode; single **mixed layer** polymer **electroluminescent devices** incorporating new electron transport materials)

IT 7429-90-5, Aluminum, uses
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(cathode; single **mixed layer** polymer **electroluminescent devices** incorporating new electron transport materials)

IT **61843-06-9 138372-67-5 309287-20-5 341972-57-4 423917-55-9**
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(electron-transporting material; single **mixed layer** polymer **electroluminescent devices** incorporating new electron transport materials)

IT 138184-36-8
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(single **mixed layer** polymer **electroluminescent devices** incorporating new electron transport materials)

RE.CNT 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L46 ANSWER 31 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2002:593232 HCAPLUS
DN 137:301796
TI Langmuir-Blodgett films for white light emission **EL device**
AU Kim, Ju-Seung; Lee, Kyung-Sup; Han, Eun-Mi; Gu, Hal-Bon
CS Department of Electrical Eng., Chonnam National University, Kwangju, 500-757, S. Korea
SO Molecular Crystals and Liquid Crystals Science and Technology, Section A: Molecular Crystals and Liquid Crystals (2002), 377, 125-128
CODEN: MCLCE9; ISSN: 1058-725X
PB Taylor & Francis Ltd.
DT Journal
LA English
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 66, 76
AB Langmuir-Blodgett (LB) films for white-light-emitting **layer** was deposited from **mixts.** contg. as much as 0, 10, 20 and 30 mol% of arachidic acid (AA). In the surface morphol. of LB monolayers obsd. by AFM (at. force microscope), phase sepn., which attributed to a phase-sepd. polymer and org. mol., was obsd. In the voltage-current characteristics of **EL device**, which use **mixed** monolayer of 13 **layers** deposited by LB method as an emitting layer, c.d. was much smaller than that of the spin-coated **devices**. This may be due to the large contact resistance at the interface of LB layer/org. layer inhibiting the carrier injection to the emitting layer.
ST arachidic acid Langmuir Blodgett mixed film white **electroluminescent device**; PVK BBOT TPD polyhexylthiophene arachidic acid LB film OLED
IT Langmuir-Blodgett films
(Langumuir-Blodgett mixed films for white-light-emitting **devices**)
IT Phase separation
(in mixed Langmuir-Blodgett monolayers for white-emitting **electroluminescent devices**)
IT Surface pressure-area isotherms
Surface structure
(of mixed Langmuir-Blodgett monolayers for white-emitting

electroluminescent devices)
IT Electric current-potential relationship
Luminescence, electroluminescence
(of white-light-emitting **devices** employing Langumuir-Blodgett mixed films)
IT **Electroluminescent devices**
(white-emitting; Langumuir-Blodgett mixed films for white-light-emitting **devices**)
IT **147-14-8**, Copper phthalocyanine 7429-90-5, Aluminum, uses 7789-24-4, Lithium fluoride LiF, uses 50926-11-9, Indium tin oxide
RL: **DEV (Device component use)**; USES (Uses)
(Langumuir-Blodgett mixed films for white-light-emitting **devices** contg.)
IT 65181-78-4, TPD 104934-50-1, Poly(3-hexylthiophene)
RL: **DEV (Device component use)**; MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(contg. Langumuir-Blodgett mixed films for white-light-emitting **devices**)
IT 506-30-9, Arachidic acid 7128-64-5, BBOT 25067-59-8, Poly(N-vinylcarbazole)
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(contg. Langumuir-Blodgett mixed films for white-light-emitting **devices**)
RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Crips; Surface phenomena in Chemistry and Biology 1958, P25
(2) Jordan, R; Appl Phys Lett 1996, V68(9), P1192 HCAPLUS
(3) Kato, K; Synth Met 2000, V111-112, P615 HCAPLUS
(4) Kido, J; Appl Phys Lett 1995, V67(16), P2281 HCAPLUS
(5) Kim, J; Molecular Crystals and Liquid Crystals in press

L46 ANSWER 32 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2001:763124 HCAPLUS
DN 135:325069
TI Organic **electroluminescent** element and **luminescent** apparatus employing the same
IN Ishibashi, Tadashi; Ichimura, Mari; Ueda, Naoyuki; Tamura, Shinichiro
PA Sony Corporation, Japan
SO PCT Int. Appl., 102 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
IC ICM C09K011-06
ICS H05B033-14; H05B033-22
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 2001077253	A1	20011018	WO 2001-JP3051	20010409
W: KR, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
JP 2001291591	A2	20011019	JP 2000-106430	20000407
EP 1205528	A1	20020515	EP 2001-919842	20010409

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR

US 2002106530 A1 20020808 US 2002-9021 20020319
PRAI JP 2000-106430 A 20000407
WO 2001-JP3051 W 20010409
OS MARPAT 135:325069
AB Title element contains a compd. having a high fluorescence yield and excellent thermal stability and emits a stable red light having a high color purity and a high luminance. Title element comprises a glass substrate and disposed thereon in this order, a transparent ITO electrode, a hole-transporting layer, an electron-transporting layer, and a metal electrode, wherein the hole-transporting layer and/or the electron-transporting layer comprises a **layer** of a **mixt** . comprising .gtoreq.1 aminostyryl compd. represented by the general formula Y1CH:CHX1CH:CHY2 (X1 = aryl substituented by such as NO2, etc., each Y1 and Y2 has aminophenyl, etc. in the skeleton) and a hole-blocking layer is disposed between the hole-transporting layer and the electron-transporting layer.
ST **electroluminescent** element app aminostyryl compd
IT **Electroluminescent devices**
(org. **electroluminescent** element and **luminescent** app. employing the same)
IT **4733-39-5** 51325-91-8 123847-85-8, .alpha.-NPD 232948-26-4
251101-60-7 253868-17-6 253868-91-6 288626-78-8 288626-79-9
288626-80-2 288626-81-3 288626-82-4 288626-90-4 322475-09-2
333339-14-3 333339-15-4 333339-16-5 333339-20-1 367509-22-6
367509-23-7 367509-24-8 367509-25-9 367509-26-0 367509-27-1
367509-28-2 367509-29-3 367509-30-6 367509-31-7 367509-32-8
367509-33-9 367509-34-0 367509-35-1 367509-36-2 367509-37-3
367509-38-4 367509-39-5 367509-40-8 367509-41-9 367509-42-0
RL: **DEV (Device component use)**; USES (Uses)
(org. **electroluminescent** element and **luminescent** app. employing the same)
RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Idemitsu Kosan Company Limited; JP 02247278 A HCAPLUS
(2) Idemitsu Kosan Company Limited; JP 03231970 A HCAPLUS
(3) Idemitsu Kosan Company Limited; EP 388768 A2 1990 HCAPLUS
(4) Sony Corporation; JP 11329731 A HCAPLUS
(5) Sony Corporation; JP 200012226 A
(6) Sony Corporation; EP 960927 A2 1999 HCAPLUS
(7) Sony Corporation; EP 967834 A2 1999 HCAPLUS
(8) Sony Corporation; JP 200012224 A 2000

L46 ANSWER 33 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2001:435462 HCAPLUS
DN 135:53381
TI Organic **electroluminescence device**
IN Toguchi, Satoru; Ishikawa, Hitoshi; Tada, Hiroshi; Morioka, Yukiko; Oda, Atsushi
PA Japan
SO U.S. Pat. Appl. Publ., 13 pp.
CODEN: USXXCO
DT Patent
LA English
IC H05B033-12
NCL 428690000
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related

Properties)
Section cross-reference(s): 76

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 2001003629	A1	20010614	US 2000-732715	20001211
US 6565993	B2	20030520		
JP 2001167886	A2	20010622	JP 1999-353675	19991213
EP 1109234	A2	20010620	EP 2000-250433	20001213

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO

PRAI JP 1999-353675 A 19991213

AB Org. **electroluminescent devices** having at least an emission layer and an electron-transporting layer between an anode and cathode are described in which an intermediate layer 1-20 nm thick is present between the emission layer and electron-transporting layer and the intermediate layer is comprised of a material having an **ionization potential larger** than the material used for the emission layer.

ST org **electroluminescent device**

IT **Electroluminescent devices**
(org.; org. **electroluminescent devices**)

IT 2085-33-8, Tris(8-hydroxyquinolinato)aluminum **4733-39-5**, Bathocuproine 123847-85-8, NPB 150405-69-9, TAZ 344362-43-2 344396-61-8, IDE 110 344396-72-1, IDE 120
RL: **DEV (Device component use)**; USES (Uses)
(org. **electroluminescent devices**)

L46 ANSWER 34 OF 69 HCAPLUS COPYRIGHT 2003 ACS

AN 2001:451043 HCAPLUS

DN 135:68353

TI Organic **electroluminescence device**

IN Morioka, Yukiko; Oda, Atsushi; Ishikawa, Hitoshi; Toguchi, Satoru; Tada, Hiroshi

PA NEC Corporation, Japan

SO Eur. Pat. Appl., 36 pp.
CODEN: EPXXDW

DT Patent

LA English

IC ICM H01L051-20

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI EP 1109235	A2	20010620	EP 2000-250437	20001215

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO

US 2001006742	A1	20010705	US 2000-736519	20001213
JP 2001237078	A2	20010831	JP 2000-380812	20001214

PRAI JP 1999-356682 A 19991215

OS MARPAT 135:68353

AB Org. **electroluminescent devices** including at least a cathode, a light-emitting zone, and an anode are described in which the light-emitting zone comprises a mixt. contg. .gtoreq.2 compds. and the spectrum of the **luminescence** from light-emitting zone includes .gtoreq.1 peak at a wavelength which is different from any one of

fluorescent peak positions of the compds. included in light-emitting zone.
ST org **electroluminescent device luminescent layer mixt**
IT **Electroluminescent devices**
(org.; org. **electroluminescent devices** with emitting **layers** employing **mixts.**)
IT 198-55-0, Perylene **15082-28-7** 37271-44-6 50926-11-9, ITO 146162-49-4 221453-37-8 227939-49-3 265120-82-9 282535-70-0
RL: **DEV (Device component use)**; USES (Uses)
(org. **electroluminescent devices** with emitting **layers** employing **mixts.**)

L46 ANSWER 35 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 2002-382169 [41] WPIX
DNN N2002-299132 DNC C2002-107681
TI **Electroluminescence** producing **device** for e.g. billboards, signs, computer monitors has organic light emitting **device** including emissive layer having charge carrying host material doped with phosphorescent material.
DC E12 E13 L03 U11 U12 U14 W05 X26
IN ADACHI, C; BALDO, M A; FORREST, S R
PA (UYPR-N) UNIV PRINCETON
CYC 95
PI WO 2001093642 A1 20011206 (200241)* EN 62p H05B033-14
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
AU 2001065143 A 20011211 (200241) H05B033-14
ADT WO 2001093642 A1 WO 2001-US17370 20010529; AU 2001065143 A AU 2001-65143 20010529
FDT AU 2001065143 A Based on WO 200193642
PRAI US 2000-629335 20000801; US 2000-207330P 20000530
IC ICM H05B033-14
AB WO 200193642 A UPAB: 20020701
NOVELTY - An **electroluminescence** producing **device** comprises an organic light emitting **device** including an emissive layer comprising a charge carrying host material doped with a phosphorescent material having a triplet excited state with a triplet energy that is less than the triplet state energy of the lowest triplet excited state of the charge carrying host material.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method of fabricating the organic light emitting **device** (OLED) comprising:
(1) forming an anode layer over a substrate;
(2) depositing a hole transporting layer over the anode layer;
(3) selecting an electron transporting host material and a phosphorescent dopant material, where the electron transporting host material has a lowest triplet excited state that is of higher energy than the emissive triplet excited state of the phosphorescent dopant material;
(4) depositing the electron transporting host material together with the phosphorescent dopant material over the hole transporting layer, to produce a first electron transporting layer comprising the electron transporting host material doped with the phosphorescent dopant material;
(5) depositing a second electron transporting layer over the first electron transporting layer; and

(6) depositing a cathode layer upon the first electron transporting layer.

USE - The inventive **device** is used for producing **electroluminescence**. It can be used in any type of **device** that includes the OLED(s) including billboards and signs, computer monitors, vehicles, telecommunications **devices**, telephones, printers, televisions, large area wall screens, theater screens and stadium screens.

ADVANTAGE - The inventive **device** provides high efficiency and improved recombination efficiency of holes and electrons in the phosphorescent dopant materials that is provided by charge-carrier-trapping of holes.

Dwg.0/10

FS CPI EPI
FA AB; GI; DCN
MC CPI: E05-L03D; E06-D05; E06-E01; E06-F01; E07-D13C; E07-E04; L03-G05F
EPI: U11-A15B; U12-B03C; U14-J02D2; W05-E03; X26-J

L46 ANSWER 36 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 2002-025732 [03] WPIX
DNN N2002-019969 DNC C2002-007075
TI Charge transport material for charge transport layer and opto-electronic **devices**, has arylene group(s) which contains residue(s) of anti-oxidant and/or radical scavenger covalently bond (in)directly to arylene moiety.
DC A26 A89 E14 G08 P84 S06
IN BROWN, B A; LEEMING, S W; MORGAN, J D; VERES, J; WRIGHT, E
PA (AVEC-N) AVECIA LTD
CYC 95
PI WO 2001068740 A1 20010920 (200203)* EN 34p C08G073-02
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2001037560 A 20010924 (200208) C08G073-02
ADT WO 2001068740 A1 WO 2001-GB932 20010305; AU 2001037560 A AU 2001-37560 20010305
FDT AU 2001037560 A Based on WO 200168740
PRAI GB 2000-6367 20000316
IC ICM C08G073-02
ICS C07C215-74; G03G005-047
AB WO 200168740 A UPAB: 20020711
NOVELTY - A charge transport material (CTM) has arylene group(s) which contains residue(s) of anti-oxidant and radical scavenger covalently bonded either directly or indirectly to arylene moiety of CTM.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) substituted arylene derivatives of formula (I);

(2) **mixture** of substituted arylene **compounds**, where the average number of repeating units (m) in the mixture is 4-20;

(3) mixture of polymers derived from triarylamine which is obtained by reacting monomer(s) of halogen substituted arylene amide derivatives of formula (II);

(4) halogen substituted arylene amide derivatives (II);

(5) substituted arylene amide derivatives of formula (III);

(6) composition comprising compound (a) having arylene group(s) which

contains residue(s) of anti-oxidant or radical scavenger covalently bonded either directly or indirectly to arylene moiety of the compound, and (b) an analogous compound to component (a) which does not contain covalently bound residue of anti-oxidant or radical scavenger.

Ar1, Ar2 = arylene optionally substituted by 1-40C optionally substituted hydrocarbyl groups;

Ar3 = aryl optionally substituted by hydroxy, mercapto, alkoxy, amino, alkylamino or 1-40C hydrocarbyl groups which may themselves be substituted or substituted by direct bond or bridging group linking different chain residues of formula (I);

Y = nitrogen, sulfur, selenium, arsenic or phosphorus;

n = 0 or 1, and 0 when Y is sulfur or selenium;

m = 1-2000;

X1, X2 = bridging group or direct bond;

A, B = hydrogen, hydroxy, amino, substituted amino or polymerization terminating group.

At least A, B and Ar3 contains residue of anti-oxidant and/or radical scavenger.

Ar4,Ar5 = phenylene or naphthylene, optionally substituted by optionally substituted 1-40C hydrocarbyl;

Ar6 = optionally substituted phenyl or naphthyl;

Hal = halogen.

The monomers are reacted in an inert atmosphere and in an anhydrous aprotic solvent in the presence of zerovalent nickel triaryl- or trialkyl-phosphine complex and optionally in presence of 1 or more polymerization terminating groups T-Hal, where T is the residue of polymerization terminating group provided that at least T or Ar6 in each of polymer chain contains the residue of optionally protected anti-oxidant or radical scavenger.

Ar6 = contains residue of optionally protected anti-oxidant or radical scavenger.

T1,T2 = hydrogen, halogen or polymerization terminating group, provided that T1 or T2 contains the residue of optionally protected anti-oxidant or radical scavenger.

USE - For charge transport layer, opto-electronic **devices**, electro reprographic **devices**, and other electronic **devices** such as electro **luminescent** (**EL**) **device**, organic light-emitting **device**, p-n junction diodes, solar cells and/or batteries, photovoltaic **devices**, photodetectors, optical sensors, phototransducers, bipolar junction transistors, heterojunction bipolar transistors and/or switching transistors, field effect transistors, charge transfer **devices**, lasers, p-n-p-n switching **devices**, optically active **EL** **devices**, thin film transistors, organic radiation detectors, infra-red emitters, tunable microcavities for variable output wavelength, telecommunication **devices** and applications, optical computing **devices**, optical memory **devices**, general designs of detectors and sensors and chemical detectors.

ADVANTAGE - The charge transport material has excellent resistance to image deletion and dark decay.

Dwg.0/0

FS CPI EPI GMPI

FA AB; GI; DCN

MC CPI: A05-J; A12-L05B; E05-G02; E05-H; E05-K; E10-A15F; E10-B01A; E10-B03A; E10-B04A2; E10-E01; E10-E02U; E10-G03; E10-H01; E10-H04D1; G06-F03A

EPI: S06-A01A1

L46 ANSWER 37 OF 69 WPIX (C) 2003 THOMSON DERWENT

AN 2001-256274 [26] WPIX
DNN N2001-182652 DNC C2001-077112
TI Organic medium for **electroluminescent** display **device**, has single layer of continuous organic medium with thickness defined by first and second edges.
DC E12 E14 L03 U14 X26
IN CHOONG, V; LEE, H; SHI, S Q
PA (MOTI) MOTOROLA INC
CYC 1
PI US 6194089 B1 20010227 (200126)* 10p H05B033-14
ADT US 6194089 B1 US 1998-96088 19980611
PRAI US 1998-96088 19980611
IC ICM H05B033-14
AB US 6194089 B UPAB: 20010515
NOVELTY - An organic medium has a single layer of a continuous organic medium having a thickness defined by a first edge and an oppositely opposed spaced apart second edge.

DETAILED DESCRIPTION - An organic medium has a single layer of a continuous organic medium AxByCz having a thickness defined by a first edge and an oppositely opposed spaced apart second edge (A = component capable of transporting electrons; B = component capable of transporting holes; C = hole injecting material; x = content of the A component in the medium with a value from a fraction of a percent at the first edge to 100% at the second edge; y = content of the B component in the medium with a value of a fraction of a percent at the second edge; and z = content of the C component in the medium with a value of a fraction of a percent at the second edge). The contents of the B and C components in combination range to 100% at the first edge.

An INDEPENDENT CLAIM is also included for an organic **electroluminescent** (**EL**) **device**, comprising a cathode in physical contact with a second side of a single organic **EL** layer; and an anode in physical contact with a first side of the organic **EL** layer. The cathode, the organic **EL** layer, and the anode are laminated in sequence. The organic **EL** layer comprises continuous organic medium AxByCz.

USE - For **electroluminescent** display **device**.

ADVANTAGE - The organic **EL device** having the organic medium provides an improved reliability by eliminating the heterojunctions, and suppressing the aggregation or re-crystallization tendency of organic materials with the formation of a single **layer** of an organic **mixture**. Further, the reliability is increased by including a component of hole material in the single layer or organic material. The emission efficiency and the color of the **device** are controlled by the selection of the dye or pigment, and the concentration of the dye or pigment in the organic **EL** medium.

Dwg.0/1
FS CPI EPI
FA AB; GI; DCN
MC CPI: E05-B01; E05-B03; E05-E01; E05-G02; E05-L03B; E05-L03D; E10-B01A2; E10-B01A4; E10-B03A; E10-B04A2; E23-B; E25-E01; L03-C04
EPI: U14-J02A; X26-J

L46 ANSWER 38 OF 69 HCAPLUS COPYRIGHT 2003 ACS DUPLICATE 2
AN 2001:376215 HCAPLUS
DN 135:217837
TI Energy transfer from singlet to triplet excited states in organic light-emitting **device**
AU Zhang, J.; Kan, S.; Ma, Y.; Shen, J.; Chan, W.; Che, C.

CS Key Lab of Supramolecular Structure and Spectroscopy, Jilin University, Jilin, 130023, Peop. Rep. China
SO Synthetic Metals (2001), 121(1-3), 1723-1724
CODEN: SYMEDZ; ISSN: 0379-6779
PB Elsevier Science S.A.
DT Journal
LA English
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 22, 36, 78
AB The single-**layer devices** using a **mixt.** film of triplet emitting material Cu4(C.tplbond.CPh4)L2[L = 1,8-bis(diphenylphosphino)-3,6-dioxaoctane](Cu4), the electron transport mol. 2-(4-biphenyl)-5-(4-t-butylprenyl)-1,3,4-**oxadiazole** (PBD) and the hole transport polymer poly(9-vinylcarbazole) (PVK) demonstrated practicality of enhanced efficiencies. Both Forster and Dexter energy transfer were involved in the **device**.
ST energy transfer singlet triplet org emitting **device**
IT Energy transfer
(Dexter and Forster; energy transfer from singlet to triplet excited states in org. light-emitting **device**)
IT Electron transport
Electron-hole recombination
Excited triplet state
Films
Hole transport
Intersystem crossing
Luminescence
Luminescence, electroluminescence
Singlet state excitation
UV and visible spectra
(energy transfer from singlet to triplet excited states in org. light-emitting **device**)
IT Polymers, properties
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(hole transport; energy transfer from singlet to triplet excited states in org. light-emitting **device**)
IT **Electroluminescent devices**
(org.; energy transfer from singlet to triplet excited states in org. light-emitting **device**)
IT **852-38-0**, PBD
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(electron transport mol.; energy transfer from singlet to triplet excited states in org. light-emitting **device**)
IT 7429-90-5, Aluminum, uses 7789-24-4, Lithium fluoride, uses 50926-11-9, ITO
RL: **DEV (Device component use)**; USES (Uses)
(energy transfer from singlet to triplet excited states in org. light-emitting **device**)
IT 25067-59-8, Poly(9-vinylcarbazole)
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(hole transport film; energy transfer from singlet to triplet excited states in org. light-emitting **device**)
IT 209802-03-9
RL: **DEV (Device component use)**; PEP (Physical, engineering or

chemical process); PRP (Properties); PROC (Process); USES (Uses)
(triplet emitter; energy transfer from singlet to triplet excited states in org. light-emitting **device**)
RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Baldo, M; Nature 1998, V395, P151 HCAPLUS
(2) Demas, J; Anal Chem 1991, V63, P829A HCAPLUS
(3) Ma, Y; Synth Met 1998, V94, P245 HCAPLUS

L46 ANSWER 39 OF 69 HCAPLUS COPYRIGHT 2003 ACS DUPLICATE 3
AN 2002:142132 HCAPLUS
DN 136:270149
TI Graded doping in active layer for achievement of high brightness and efficiency organic light-emitting **devices**
AU Gao, WenBao; Yang, Kaixia; Liu, Hongyu; Feng, Jing; Hou, Jingying; Liu, ShiYong
CS National Integrated Optoelectronics Laboratory, Jilin University, Changshun, 130023, Peop. Rep. China
SO Proceedings of SPIE-The International Society for Optical Engineering (2001), 4594(Design, Fabrication, and Characterization of Photonic Devices II), 385-390
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
AB A graded doping technique was presented to fabricate high brightness and high efficiency OLEDs, in which a Cu phthalocyanine (CuPc) film acts as buffer layer .alpha.-naphthylphenybiphenyl amine (NPB) film as hole-transport layer and a tris(8-hydroxyquinolinolate) aluminum (Alq3) film as the electron-transport layer. The **luminescent layer** consists of the **mixt**. of NPB, Alq3 and an emitting dopant 5,6,11,12-tetraphenylnaphthacene (Rubrene), where the concn. of NPB raised while the concn. of Alq3 was declined gradually in the deposition process. The graded doping **device** exhibited the max. emission of 50000 cd/m2 at 35 V and the max. efficiency of .apprx.8cd/A at 9 V, resp., which were improved by four times in comparison with the conventional doped **devices**.
ST graded doping active layer brightness LED; efficiency org light emitting **device**
IT **Electroluminescent devices**
(graded doping in active layer for achievement of high brightness and efficiency org. light-emitting **devices**)
IT Doping
(graded; graded doping in active layer for achievement of high brightness and efficiency org. light-emitting **devices**)
IT 7429-90-5, Aluminum, uses 7789-24-4, Lithium fluoride, uses 50926-11-9, Indium tin oxide
RL: **DEV (Device component use)**; USES (Uses)
(graded doping in active layer for achievement of high brightness and efficiency org. light-emitting **devices**)
IT **147-14-8**, Copper phthalocyanine 517-51-1, 5,6,11,12-Tetraphenylnaphthacene 2085-33-8, Aluminum Tris(8-hydroxyquinolinato) 123847-85-8, NPB
RL: **DEV (Device component use)**; PRP (Properties); USES (Uses)
(graded doping in active layer for achievement of high brightness and

efficiency org. light-emitting **devices**)
RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Aziz, H; science 1999, V283, P1900 HCAPLUS
(2) Burrows, P; J Appl Phys 1996, V79(10), P7991 HCAPLUS
(3) Choong, V; Appl Phys Lett 1999, V75(2), P172 HCAPLUS
(4) Choong, V; J Phys D: Appl Phys 2000, V33, P760 HCAPLUS
(5) Crone, B; J Appl Phys 1998, V84, P833 HCAPLUS
(6) Hamada, Y; Jpn J Appl Phys 1995, V34, P824
(7) Malliaras, G; J Appl Phys 1998, V83, P5399 HCAPLUS
(8) Popovic, Z; Proc SPIE 1998, V3476, P68 HCAPLUS
(9) Shen, J; J Appl Phys 2000, V87(8), P3891 HCAPLUS
(10) Tang, C; Appl Phys Lett 1987, V51, P913 HCAPLUS
(11) Tang, C; Appl Phys Lett 1987, V51, P913 HCAPLUS
(12) Tang, C; J Appl Phys 1989, V65, P3610 HCAPLUS
(13) Van Slyke, S; Appl Phys Lett 1996, V69, P2160 HCAPLUS
(14) Yang, J; J Appl Phys 1998, V84, P2105 HCAPLUS

L46 ANSWER 40 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2001:806944 HCAPLUS
DN 136:44832
TI Dependence of structure on **luminescent** efficiency and operation lifetime in organic ELDs
AU Li, Wen-lian
CS Lab. of Excited State Process, Chinese Academy of Sciences, Changchun, 130021, Peop. Rep. China
SO Yejing Yu Xianshi (2001), 16(3), 209-213
CODEN: YYXIFY; ISSN: 1007-2780
PB Kexue Chubanshe
DT Journal
LA Chinese
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 22
AB The dependence of structure on efficiency and lifetime of org. **EL devices** was described and efficiency and lifetime of the **devices** with the **mixing** emitting **layer** structure are much higher than that of traditional **devices** with heterostructure. Efficiency and lifetime of **devices** can obviously be enhanced by introducing anode buffer layer (such as CuPc), cathode buffer layer (such as LiF) into the **devices** and fluorescent dye into the HTL. Taking Al:Li/Alq3, Al/LiF/Alq3, Al/LiF:Alq3/Alq3 and Al/Li:Alq3/Alq3 for examples, the effects of various cathode contact schemes on the efficiency and lifetime of the ELDs **devices** were compared, the expt. results show that all of the cathode contact schemes can improve the efficiency and lifetime of the org. ELDs.
ST org LED structure dependence **luminescence** efficiency operation lifetime
IT **Electroluminescent devices**
(structure dependence of **luminescent** efficiency and operation lifetime in org.)
IT Fluorescent dyes
(structure dependence of **luminescent** efficiency and operation lifetime in org. LEDs contg.)
IT **Luminescence**
(structure dependence of org. LED efficiency of)
IT **147-14-8**, Copper phthalocyanine 2085-33-8, Tris(8-

hydroxyquinolinato)aluminum 7429-90-5, Aluminum, uses 7789-24-4, Lithium fluoride, uses 65181-78-4, TPD 67605-76-9, N-Methylquinacridone 123847-85-8, NPB (photoreceptor)
RL: **DEV (Device component use)**; USES (Uses)
(structure dependence of **luminescent** efficiency and operation lifetime in org. LEDs contg.)

L46 ANSWER 41 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2000:665894 HCAPLUS
DN 133:244864
TI Organic **electroluminescent devices**
IN Ueba, Yoshinobu; Kamimura, Takashi; Okuda, Nobuyuki; Ono, Junichi; Minami, Nobuyuki
PA Sumitomo Electric Industries, Ltd., Japan; Harness Sogo Gijitsu Kenkyusho K. K.; Sumitomo Denso K. K.
SO Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H05B033-28
ICS B32B009-00; H05B033-04; H05B033-10; H05B033-14
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2000260572	A2	20000922	JP 1999-57332	19990304
PRAI JP 1999-57332		19990304		

AB The **devices** comprise: (1) a glass substrate; (2) an ITO anode; (3) an org. hole transport, (4) an org. phosphor and (5) an org. electron transport layer; (6) a cathode 1st **layer** comprising a **mixt.** of an org. electron transport material and an inorg. compd. selected from a metal having a small work function, the oxide and the halide thereof; and (7) a cathode 2nd layer comprising ITO, where (1)-(7) are sealed in an inert atm. or in vacuum.
ST **electroluminescent** ITO phosphor electron transport electrode
IT Anodes
Cathodes
Composites
Electroluminescent devices
Electron transport
Hole transport
Vacuum
Work function
(org. **electroluminescent devices**)
IT Fluoropolymers, uses
Halides
Inorganic compounds
Oxides (inorganic), uses
Polycarbonates, uses
RL: **DEV (Device component use)**; USES (Uses)
(org. **electroluminescent devices**)
IT Electrodes
(transparent; org. **electroluminescent devices**)
IT **147-14-8**, Copper phthalocyanine 2085-33-8, Tris(8-quinolinolato)aluminum 7069-05-8, Bis(8-quinolinolato)calcium 7789-24-4, Lithium fluoride (LiF), uses 9002-89-5, Polyvinyl alcohol 12057-24-8, Lithium oxide (Li2O), uses 24937-79-9, Polyfluorovinylidene

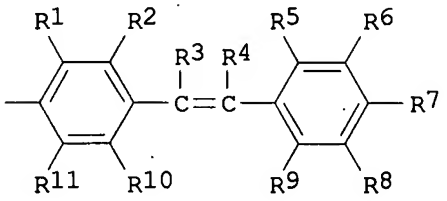
25387-93-3, (8-Quinolinolato)lithium 25667-42-9, Poly(oxy-1,4-phenylenesulfonyl-1,4-phenylene) 50926-11-9, ITO 123847-85-8 185690-39-5 292827-46-4 292836-44-3
RL: **DEV (Device component use)**; USES (Uses)
(org. **electroluminescent devices**)

IT 198-55-0, Perylene 517-51-1, Rubrene 221455-80-7 292842-20-7, NKX 1986
RL: MOA (Modifier or additive use); USES (Uses)
(org. **electroluminescent devices**)

L46 ANSWER 42 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2000:277799 HCAPLUS
DN 132:315621
TI Organic **electroluminescent device** using hole-injectable, light-emitting material
IN Oda, Atsushi; Ishikawa, Hitoshi; Toguchi, Satoru; Morioka, Yukiko
PA NEC Corporation, Japan
SO Eur. Pat. Appl., 28 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H01L051-20
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 996177	A2	20000426	EP 1999-121184	19991022
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2000133455	A2	20000512	JP 1998-302547	19981023
	US 2002160225	A1	20021031	US 1999-425052	19991022
	KR 2000029273	A	20000525	KR 1999-46178	19991023
PRAI	JP 1998-302547	A	19981023		

OS MARPAT 132:315621
GI



I

AB Org. **electroluminescent device** comprising at least an anode, an org. light-emitting zone which consists of .gtoreq.1 org. thin-film layers, and a cathode are described in which the org. light-emitting zone is adjacent to the anode, and a layer contacting the anode in the light-emitting zone contains, either singly or as a **mixt.**, a **compd.** represented by the general formula Ar2-N(Ar3)-Ar1-N(Ar4)-Ar5 (Ar1 = an (un)substituted arylene group 5-42 carbons, Ar2-5 = independently selected (un)substituted C6-20 aryl groups; .gtoreq.1 of Ar2-5 = styrylphenyl represented by the general formula I;

and R1-11 = independently selected H, halo, (un)substituted amino (excluding diarylamino), OH, cyano, nitro, C1-6 alkyl, C1-6 alkoxy group, (un)substituted C6-18 aryl, and (un)substituted C6-18 aryloxy groups)..

ST styrylamino group contg diarylaminoarylene **electroluminescent device**

IT **Electroluminescent devices**
Electroluminescent devices
(org. **electroluminescent devices** using styrylamino group-contg. diarylaminoarylenes)

IT 2085-33-8, Tris(8-hydroxyquinolinato)aluminum **15082-28-7**
37271-44-6 38215-36-0 50926-11-9, Indium tin oxide **138372-67-5**
142289-08-5 146162-49-4 146162-54-1 150405-69-9 186409-20-1
221453-36-7 221453-37-8 221453-38-9 221453-40-3 227010-25-5
247585-27-9 252644-43-2 252645-38-8 259143-64-1 264126-81-0
265120-80-7 265120-81-8 265120-82-9 265120-83-0 265120-84-1
265120-85-2 265120-86-3 265120-87-4 265120-88-5 265120-89-6
265120-90-9 265120-91-0 265120-92-1 265120-93-2 265120-94-3
265120-95-4 265120-96-5 265120-97-6 265120-98-7 265120-99-8
265121-00-4
RL: **DEV (Device component use)**; USES (Uses)
(org. **electroluminescent devices** using styrylamino group-contg. diarylaminoarylenes)

L46 ANSWER 43 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 2000-387223 [33] WPIX
DNN N2000-289909 DNC C2000-117459
TI Materials for use in **electroluminescent devices** comprises an organic complex of a transition metal, lanthanide or an actinide.
DC A14 A26 A85 E19 L03 U11 U14 X12 X26
IN KATHIRGAMANATHAN, P
PA (UYSB-N) UNIV SOUTH BANK ENTERPRISES LTD
CYC 88
PI WO 2000026323 A1 20000511 (200033)* EN 25p C09K011-06
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW
AU 2000010562 A 20000522 (200040) C09K011-06
EP 1131388 A1 20010912 (200155) EN C09K011-06
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT SE SI
BR 9915252 A 20011204 (200203) C09K011-06
KR 2001080930 A 20010825 (200215) C09K011-07
CN 1325431 A 20011205 (200223) C09K011-06
JP 2002528633 W 20020903 (200273) 24p C09K011-06
AU 754481 B 20021114 (200303) C09K011-06
ADT WO 2000026323 A1 WO 1999-GB3619 19991102; AU 2000010562 A AU 2000-10562 19991102; EP 1131388 A1 EP 1999-954123 19991102, WO 1999-GB3619 19991102; BR 9915252 A BR 1999-15252 19991102, WO 1999-GB3619 19991102; KR 2001080930 A KR 2001-705447 20010430; CN 1325431 A CN 1999-812949 19991102; JP 2002528633 W WO 1999-GB3619 19991102, JP 2000-579697 19991102; AU 754481 B AU 2000-10562 19991102
FDT AU 2000010562 A Based on WO 200026323; EP 1131388 A1 Based on WO 200026323; BR 9915252 A Based on WO 200026323; JP 2002528633 W Based on WO 200026323; AU 754481 B Previous Publ. AU 200010562, Based on WO 200026323

PRAI GB 1998-23761 19981102
IC ICM C09K011-06; C09K011-07
ICS C07C049-92; C07D213-50; C07D317-04; C07F005-00; H01L051-20; H05B033-14; H05B033-22
AB WO 200026323 A UPAB: 20000712
NOVELTY - Photoluminescent and **electroluminescent** materials comprising an organic complex of a transition metal, lanthanide or an actinide and an organic ligand are new. Photoluminescent materials emit light in the blue or purplish blue spectrum, **electroluminescent** materials also emits light in the same spectrum when electric current is passed through it.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:
(i) a composition which comprises an inert polymer and **electroluminescent** materials (5 - 95 wt.%); and
(ii) an **electroluminescent device** which comprises **electroluminescent** materials deposited on a transparent substrate.
USE - To form **electroluminescent devices** (claimed).
ADVANTAGE - The compounds are stable. The hole transporting layer blocks the electrons from moving into the electrode without recombining with the holes.
Dwg.0/6
FS CPI EPI
FA AB; DCN
MC CPI: A12-E11; E24-A03; L03-C04; L03-D01D
EPI: U11-A15; U14-J02A; X12-D02A1; X26-J

L46 ANSWER 44 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 2000-646411 [62] WPIX
DNN N2000-479011 DNC C2000-195430
TI Organic medium for use in **electroluminescent** display **device** comprises complex of organic metallic complex and aromatic tertiary amine and the complex is incorporated rubrene derivative.
DC E19 L03 U11 U14 X26
IN CHOONG, V; SO; F
PA (MOTI) MOTOROLA INC
CYC 1
PI US 6114055 A 20000905 (200062)* 10p H05B033-14
ADT US 6114055 A US 1998-90357 19980601
PRAI US 1998-90357 19980601
IC ICM H05B033-14
AB US 6114055 A UPAB: 20020402
NOVELTY - Organic medium (18) comprises single layer containing organo metallic complex serving as electron transporting agent and aromatic tertiary amine moieties to transport holes. The organic medium is also incorporated with rubrene (derivative).
DETAILED DESCRIPTION - Organic medium comprises single layer of formula AxBy (I) with thickness of both anode (16) and cathode (14) which are formed sequentially.
A = component capable of transporting electrons;
B = component capable of transporting holes;
x = content of A present in the medium AxBy with values ranging from 0% adjacent to anode and 100% adjacent to cathode;
y = content of B component in AxBy with values ranging from 0% adjacent to cathode and 100% adjacent to anode.
Rubrene (derivative) is also incorporated in organic medium.
USE - For **electroluminescent** display **device**.
ADVANTAGE - The efficiency of organic **electroluminescent** is

enhanced with reliability. Aggregation or recrystallization tendency of organic materials is suppressed by the formation of single **layer** of organic **mixture**. The quantum efficiency of the **electroluminescent device** is improved.

DESCRIPTION OF DRAWING(S) - The figure illustrates organic **electroluminescent device**.

Cathode 14

Anode 16

Organic medium 18

Dwg.1/1

FS CPI EPI

FA AB; GI; DCN

MC CPI: E05-B01; E05-B03; E05-E01; E05-G09B; E05-L03D; E10-B01E; E10-B02D8; L03-C04

EPI: U11-A15; U14-J; X26-J

L46 ANSWER 45 OF 69 WPIX (C) 2003 THOMSON DERWENT

AN 2000-399009 [34] WPIX

CR 2001-416592 [33]

DNN N2000-298890 DNC C2000-120370

TI An **electroluminescent device** for use in TV screens, computer screens, and the like comprises an anode, a hole transporting layer, a light emitting layer, and a cathode.

DC E11 L03 U11 U14

IN ESTEGHAMATIAN, M; HOR, A; HU, N; ONG, B S; POPOVIC, Z D; QI, Y

PA (XERO) XEROX CORP

CYC 1

PI US 6057048 A 20000502 (200034)* 31p H05B033-14

ADT US 6057048 A US 1998-164753 19981001

PRAI US 1998-164753 19981001

IC ICM H05B033-14

AB US 6057048 A UPAB: 20010809

NOVELTY - An **electroluminescent device** comprised of an anode, a hole transporting layer, a light emitting layer, and a cathode.

DETAILED DESCRIPTION - The light emitting layer contains a component of the formula (I):

Ar1-Ar4 = each independently aryl or optionally aliphatic; R1 and R2 = independently H, aliphatic, halogen, and cyano; L = a conjugated bivalent group; and n = 0-3.

USE - The **device** is used in flat-panel emissive display technologies, including TV screens, computer screens, and the like.

ADVANTAGE - The **device** is capable of providing uniform **luminescent**, saturated color in the blue, green and red regions of the visible spectrum, and low driving voltages.

DESCRIPTION OF DRAWING(S) - The drawing shows an **EL device** or an organic light emitting diode.

A supporting substrate 1

An anode 2

A buffer layer 3

Hole transporting layer 4

Organic light emitting layer 5

A cathode 6

Dwg.1/2

FS CPI EPI

FA AB; GI; DCN

MC CPI: E07-D13B; E07-D13C; E07-E04; E07-F03; L03-H04A

EPI: U11-A15; U14-J

L46 ANSWER 46 OF 69 HCAPLUS COPYRIGHT 2003 ACS DUPLICATE 4
AN 2000:377672 HCAPLUS
DN 133:80995
TI White light **electroluminescence** from a hole-transporting **layer** of **mixed** organic materials
AU Gao, Z. Q.; Lee, C. S.; Bello, I.; Lee, S. T.
CS Center of Super-Diamond and Advance Films (COSDAF) and Department of Physics and Materials Science, City University of Hong Kong, Kowloon, Hong Kong, Peop. Rep. China
SO Synthetic Metals (2000), 111-112, 39-42
CODEN: SYMEDZ; ISSN: 0379-6779
PB Elsevier Science S.A.
DT Journal
LA English
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
AB White light emission is important for full color display and back-lighting applications of org. **electroluminescence devices**. A white light org. **electroluminescent device** was fabricated by employing a hole-transporting **layer** (HTL) of **mixed** light-emitting org. materials. The **device** has a structure of glass substrate In Sn oxide (ITO) mixed HTL Tris(acetylacetonato) (**monophenanthroline**) (Tb(ACAC)3Phen) Mg:Ag. The mixed HTL was prepd. by spin coating of a soln. of poly(N-vinylcarbazole) (PVK), N,N'-bis-(1-naphthyl)-N,N'-diphenyl-1'-biphenyl-4,4'-diamine (NPB) and 1,1-bis(4-tolylaminophenyl) cyclohexane (TAPC). The Tb complex layer plays several roles in the present **device**. It is an electron-transporting layer as well as a green light-emitting layer. It also functions as a hole-blocking layer such that recombination of electrons and holes can also take place in the HTL. Blue and red emissions are due to the NPB and TPAC in the HTL. Together with the green emission from the Tb complex, white light emission >1000 cd/m2 was achieved at a driving voltage of 20 V.
ST photoluminescence **electroluminescence** terbium acetylacetonato **phenanthroline** LED
IT **Electroluminescent devices**
Luminescence
Luminescence, electroluminescence
(white light **electroluminescence** from a hole-transporting **layer** of **mixed** org. materials)
IT **18078-86-9** 25067-59-8, Polyvinyl carbazole 26513-41-7 123847-85-8, NPB
RL: **DEV (Device component use)**; PRP (Properties); USES (Uses)
(white light **electroluminescence** from a hole-transporting **layer** of **mixed** org. materials)
RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L46 ANSWER 47 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 2000:434176 HCAPLUS

DN 133:46038
TI The photovoltaically active junction in molecular organic solar cells
AU Rostalski, Jorn
CS Forschungszentrum Juelich GmbH, Julich, D-52425, Germany
SO Berichte des Forschungszentrums Juelich (1999), Juel-3729, i-iii, a, b, c, 1-163
CODEN: FJBEE5; ISSN: 0366-0885
DT Report
LA German
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 73
AB The org. junction of vacuum sublimated thin films of p-type zinc-phthalocyanine (ZnPc) and the n-type perylene pigment, N,N'-dimethyl-3,4,9,10-perylenebis(carboximide) (MPP) was investigated in detail. From modeling of exptl. detd. photocurrent spectra the active thickness of the junction formed by these two materials is detd. to be restricted to the range of about 10 nm. This modeling gives also evidence of a space charge region in which all the absorbed photons lead to photocurrent whereas the photons absorbed outside do not contribute. A careful investigation of the electroabsorption spectra-detd. for the first time in voltage dependent measurements of org. p/n-heterojunction solar cells - shows clear evidence of an elec. field within the org. solar cell. Furthermore the **luminescence** quenching obsd. when the cell is polarized in depletion fully confirms the expected voltage dependence of a space charge model. All three expts. provide clear evidence of a classical p/n-type depletion layer formed at the interface of the two org. layers. In order to achieve a higher internal photocurrent efficiency (IPCE) a **mixed layer** of ZnPc with C60 was evapd. onto the MPP layer. Instead of the classical p/n-junction of only 10 nm thickness an interconnected network is formed, extending the thickness of the photovoltaically active junction to more than 30 nm. Thereby the IPCE in the absorption max. of the solar cells was improved from about 12% to almost 40% and a short circuit current of 3.6 mA/cm2 was measured in a AM 1.5 solar simulator for 860 W/m2 light intensity.
ST heterojunction org solar cell photovoltaic effect; perylene carboximide zinc phthalocyanine org solar cell; fullerene perylene carboximide zinc phthalocyanine solar cell
IT Sublimation
(photovoltaically active junction in mol. org. solar cells prepd. by sublimation of p-type zinc-phthalocyanine and n-type perylene pigment, N,N'-dimethyl-3,4,9,10-perylenebis(carboximide) on ITO)
IT Absorption spectra
Current efficiency
Electric current
Electric current-potential relationship
Evaporation
Heterojunction solar cells
Luminescence quenching
Optical absorption
Photocurrent
Photovoltage
Pigments, nonbiological
Semiconductor junctions
Simulation and Modeling, physicochemical
Space charge
(photovoltaically active junction in mol. org. solar cells prepd. by sublimation of p-type zinc-phthalocyanine with C60 and n-type perylene pigment, N,N'-dimethyl-3,4,9,10-perylenebis(carboximide) on ITO)

IT 5521-31-3 **14320-04-8**, Zinc-phthalocyanine
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(photovoltaically active junction in mol. org. solar cells prepd. by sublimation of p-type zinc-phthalocyanine and n-type perylene pigment, N,N'-dimethyl-3,4,9,10-perylenebis(carboximide) on ITO)

IT 99685-96-8, C60 Fullerene
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(photovoltaically active junction in mol. org. solar cells prepd. by sublimation of p-type zinc-phthalocyanine with C60 and n-type perylene pigment, N,N'-dimethyl-3,4,9,10-perylenebis(carboximide) on ITO)

IT 50926-11-9, ITO
RL: **DEV (Device component use)**; USES (Uses)
(substrate; photovoltaically active junction in mol. org. solar cells prepd. by sublimation of p-type zinc-phthalocyanine and n-type perylene pigment, N,N'-dimethyl-3,4,9,10-perylenebis(carboximide) on ITO)

RE.CNT 131 THERE ARE 131 CITED REFERENCES AVAILABLE FOR THIS RECORD

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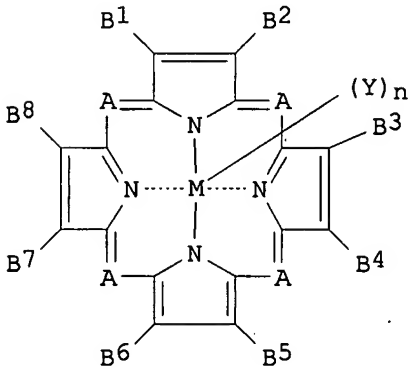
L46 ANSWER 48 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 1999:380959 HCAPLUS
DN 131:25595
TI Organic **electroluminescent device** with improved long-term stability
IN Yoon, Jong Geun; Kim, Myung Seop; Oh, Hyoung Yun; Kim, Sung Tae
PA LG Electronics Inc., S. Korea
SO Eur. Pat. Appl., 16 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H01L051-20
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 29, 76
FAN.CNT 2
PATENT NO. KIND DATE APPLICATION NO. DATE

PI	EP 917216	A2	19990519	EP 1998-306710	19980821
	EP 917216	A3	20001108		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	CN 1217582	A	19990526	CN 1998-116616	19980728
	JP 11233263	A2	19990827	JP 1998-319631	19981110
PRAI	KR 1997-60534	A	19971117		
	KR 1998-18193	A	19980520		

OS MARPAT 131:25595

GI



I

AB Org. **electroluminescent (EL) devices** are described which are provided with a layer formed of at least one porphyrinic compd.; the porphyrinic compd. is preferably a compd. described by the general formula I (A = independently selected N: or C(R):; R = H, alkyl, alkoxyl, aralkyl, alkaryl, aryl, or heterocyclic; M = element from Groups IA, IIA, IIIA, IVA, and the third, fourth, fifth and sixth periods in the periodic table; Y = alkoxyl, phenoxyl, alkylamine, arylamine, alkylphosphine, arylphosphine, alkylsulphur, and arylsulphur groups, or an element from Groups VIA and VIIA; n = 0, 1, or 2; and B1-8 each = H, alkyl, aryl, alkoxyl, aryloxyalkyl, OH, hydroxyalkyl, aralkyl, alkylamino, arylamino, alkylthiol, arylthiol, nitroalkyl, alkylcarbonyl, alkoxycarbonyl, Ph, amine, cyanyl, naphthyl, alkaryl, halo or heterocyclic, or .gtoreq.2 of which together complete (un)satd. five, six, or seven-membered ring, which preferably includes .gtoreq.1 substituents alkyl, aryl, alkoxyl, aryloxyalkyl, OH, hydroxyalkyl, aralkyl, alkylamino, arylamino, nitroalkyl, alkylcarbonyl, alkoxycarbonyl, Ph, amine, cyanyl, naphthyl, alkaryl, halo, and heterocyclic groups). Preferably, the **devices** comprise either a dual layer layer structure with one layer formed from a material selected from alkali metals, alk. earth metals, and/or their compds. and a second formed from I or a **mixed layer** formed by codeposition of these materials.

ST org **electroluminescent device** metalloporphyrin layer

IT **Electroluminescent devices**
(org. **electroluminescent devices** with porphyrinic layers for improved long-term stability)

IT Alkali metal compounds
Alkali metals, uses

Alkaline earth compounds
Alkaline earth metals
Metalloporphyrins
RL: **DEV (Device component use)**; USES (Uses)
(org. **electroluminescent devices** with porphyrinic layers for improved long-term stability)

IT 7429-90-5, Aluminum, uses
RL: **DEV (Device component use)**; USES (Uses)
(electrode; org. **electroluminescent devices** with porphyrinic layers for improved long-term stability)

IT **147-14-8**, Copper phthalocyanine 2085-33-8, Tris(8-hydroxyquinolinato)aluminum 12057-24-8, Lithium oxide, uses 50926-11-9, Indium tin oxide 65181-78-4, N,N'-Diphenyl-N,N'-bis(3-methylphenyl)-(1,1'-biphenyl)-4,4'-diamine
RL: **DEV (Device component use)**; USES (Uses)
(org. **electroluminescent devices** with porphyrinic layers for improved long-term stability)

L46 ANSWER 49 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 1999:202447 HCAPLUS
DN 130:303793
TI Degradation mechanism of small molecule-based organic light-emitting **devices**
AU Aziz, Hany; Popovic, Zoran D.; Hu, Nan-Xing; Hor, Ah-Mee; Xu, Gu
CS Department of Materials Science and Engineering, McMaster University, Hamilton, ON, Can.
SO Science (Washington, D. C.) (1999), 283(5409), 1900-1902
CODEN: SCIEAS; ISSN: 0036-8075
PB American Association for the Advancement of Science
DT Journal
LA English
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
AB Studies on the long-term degrdn. of org. light-emitting **devices** (OLEDs) based on tris(8-hydroxyquinoline) Al (AlQ3), the most widely used **electroluminescent** mol., reveal that injection of holes in AlQ3 is the main cause of **device** degrdn. The transport of holes into AlQ3 caused a decrease in its fluorescence quantum efficiency, thus showing that cationic AlQ3 species are unstable and that their degrdn. products are fluorescence quenchers. These findings explain the success of different approaches to stabilizing OLEDs, such as doping of the hole transport layer, introducing a buffer layer at the hole-injecting contact, and using **mixed** emitting **layers** of hole and electron transporting mols.
ST LED hydroxyquinoline aluminum rubrene copper phthalocyanine NPB magnesium silver; cathode magnesium silver LED hydroxyquinoline aluminum rubrene copper phthalocyanine; current voltage LED hydroxyquinoline aluminum rubrene copper phthalocyanine NPB
IT Cathodes
Electric current-potential relationship
Hole (electron)
Luminescence
(degrdn. mechanism of small mol.-based org. light-emitting **devices**)

IT **147-14-8**, Copper phthalocyanine
RL: **DEV (Device component use)**; USES (Uses)
(buffer layer; degrdn. mechanism of small mol.-based org.

light-emitting **devices**)
IT 7440-22-4, Silver, uses 37271-44-6
RL: **DEV (Device component use)**; USES (Uses)
(cathode; degrdn. mechanism of small mol.-based org. light-emitting **devices**)
IT 123847-85-8
RL: **DEV (Device component use)**; USES (Uses)
(hole injection layer; degrdn. mechanism of small mol.-based org. light-emitting **devices**)
IT 517-51-1, Rubrene
RL: **DEV (Device component use)**; MOA (Modifier or additive use); USES (Uses)
(hole-transmitting layer dopant; degrdn. mechanism of small mol.-based org. light-emitting **devices**)
IT 2085-33-8, Hydroxyquinoline aluminum
RL: **DEV (Device component use)**; USES (Uses)
(**luminescent** layer; degrdn. mechanism of small mol.-based org. light-emitting **devices**)
RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L46 ANSWER 50 OF 69 INSPEC COPYRIGHT 2003 IEE DUPLICATE 5
AN 2000:6717367 INSPEC DN B2000-11-4260D-025
TI Mechanism of the intrinsic (long-term) degradation in AlQ3-based organic light emitting **devices**.
AU Popovic, Z.D. (Xerox Res. Centre of Canada, Mississauga, Ont., Canada); Aziz, H.; Hu, N.-X.; Hor, A.-M.; Xu, G.
SO Proceedings of the SPIE - The International Society for Optical Engineering (1999) vol.3797, p.310-15. 18 refs.
Published by: SPIE-Int. Soc. Opt. Eng
Price: CCCC 0277-786X/99/$10.00
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1999)3797L.310:MILT;1-G
Conference: Organic Light-Emitting Materials and Devices III. Denver, CO, USA, 19-21 July 1999
Sponsor(s): SPIE
DT Conference Article; Journal

TC Practical; Experimental
CY United States
LA English
AB The intrinsic degradation of hydroxyquinoline aluminum (AlQ3)-based organic light emitting **devices**, that leads to the long-term decrease in the **electroluminescence** efficiency of the **devices** operated under constant current conditions, has been studied. The role of stabilizing agents, such as introducing a copper **phthalocyanine** buffer layer at the hole injection contact, doping of the hole transport **layer**, and using **mixed layers** of hole and electron transport materials has been investigated. **Devices**, which allow predominantly holes to be transported through the AlQ3 layer, showed significant decrease in photoluminescence after prolonged current flow. These results lead to the conclusion that the degradation of AlQ3 cations is the major cause of intrinsic long-term **device** degradation. This mechanism also explains some new results on the degradation of **devices** containing dual layer and doped hole transport layers as well as the increase in lifetime of **devices** containing more efficient electron injecting contacts.
CC B4260D Light emitting diodes; B4220 Luminescent materials
CT CHARGE INJECTION; **ELECTROLUMINESCENCE**; LIGHT EMITTING DIODES; ORGANOMETALLIC COMPOUNDS; PHOTOLUMINESCENCE
ST intrinsic long-term degradation; **AlQ3-based organic light emitting devices**; hydroxyquinoline aluminum; **electroluminescence efficiency**; constant current; stabilizing agents; **copper phthalocyanine buffer layer**; hole injection contact; doping; hole transport layer; **mixed layers**; electron transport materials; photoluminescence; prolonged current flow; doped hole transport layers; lifetime; efficient electron injecting contacts

L46 ANSWER 51 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 1999:702246 HCAPLUS
DN 132:71116
TI Light emitting **devices** from organic charge transfer adduct thin films
AU Kathirgamanathan, P.; Kandappu, V.; Hara, S.; Chandrakumar, K.; Marianesan, S. L.; Selvaranjan, S.; Surendrakumar, S.; Toohey, M. J.
CS Sch. Electrical, Electronic Information Engineering, Centre for Electronic Materials for Engineering, South Bank University, London, UK
SO Materials Letters (1999), 40(6), 285-293
CODEN: MLETDJ; ISSN: 0167-577X
PB Elsevier Science B.V.
DT Journal
LA English
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 22, 76
AB Thin film **devices** of charge transfer adducts of tetrathiafulvalene (TTF) were fabricated. A luminance of 5 cd m-2 was achieved for a **device** structure ITO/poly(aniline)/ TTF(NO3)0.55/Al whose **EL** spectrum has a broad peak at 645 nm. The **devices** were fabricated by spin coating from solns. of the adducts. A luminous efficiency of 5 .times. 10-4 lm W-1 was obtained for these **devices** which is comparable to that of ITO/poly(aniline)/Alq3/Al (5.2 .times. 10-4 lm W-1) under same fabrication conditions. The single **layer**, **mixed layer** and double **layer devices** fabricated in this study fit

the space charge limited model. **Devices** fabricated from [TTF-Alq3] emit white light (40 cd m-2) with a luminous efficiency of 6.6 .times. 10-4 lm W-1. The color of light emitted appears to depend on the effective oxidn. state of TTF in the adducts.

ST light emitting **device** tetra thia fulvalene charge transfer adduct; **electroluminescence** tetrathiafulvalene nitrate aluminum quinolinolato; chloride tetrathiafulvalene cation radical **luminescence**

IT Space charge
(current-voltage relationship of light emitting **devices** using tetrathiafulvalene nitrate)

IT Electron transfer
(light emitting **devices** using tetrathiafulvalene charge transfer adducts)

IT Polyanilines
RL: **DEV (Device component use)**; USES (Uses)
(light emitting **devices** using tetrathiafulvalene nitrate and poly(aniline) coated ITO electrodes)

IT **Luminescence**
Luminescence, electroluminescence
(of tetrathiafulvalene charge transfer adducts)

IT Electric current-potential relationship
(space charge limited current of light emitting **devices** using tetrathiafulvalene nitrate)

IT Optical absorption
(tetrathiafulvalene charge transfer adducts)

IT Electric current carriers
(transport; light emitting **devices** using tetrathiafulvalene nitrate)

IT **Electroluminescent devices**
(using tetrathiafulvalene nitrate and aluminum tris(quinolinolato))

IT 1518-16-7D, fluoroderivs.
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(**electroluminescence** relative to other tetrathiafulvalene adducts)

IT 31366-25-3, Tetrathiafulvalene
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(green light emitting **devices**)

IT 1518-16-7
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(light emitting **devices**)

IT **852-38-0**, PBD 9011-14-7, PMMA
RL: **DEV (Device component use)**; USES (Uses)
(light emitting **devices** using tetrathiafulvalene nitrate and)

IT 2085-33-8, Tris(8-quinolinolato)aluminum
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(light emitting **devices** using tetrathiafulvalene nitrate and)

IT 25233-30-1, Poly(aniline)
RL: **DEV (Device component use)**; USES (Uses)
(light emitting **devices** using tetrathiafulvalene nitrate and poly(aniline) coated ITO electrodes)

IT 50926-11-9, ITO
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(polyaniline coating in light emitting **devices** using tetrathiafulvalene nitrate)

RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L46 ANSWER 52 OF 69 HCAPLUS COPYRIGHT 2003 ACS

AN 1999:418071 HCAPLUS

DN 131:163088

TI Organic light-emitting diodes with a bipolar transport layer

AU Choong, Vi-En; Shi, Song; Curless, Jay; Shieh, Chan-Long; Lee, H.-C.; So, Franky; Shen, Jun; Yang, Jie

CS Phoenix Corporate Research Laboratories, Motorola, Inc., Tempe, AZ, 85284, USA

SO Applied Physics Letters (1999), 75(2), 172-174
CODEN: APPLAB; ISSN: 0003-6951

PB American Institute of Physics

DT Journal

LA English

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76

AB A structure based on a bipolar transport/emitting **layer** (comprising a **mixt.** of hole- and electron-transporting materials) is described which was used for making org. light-emitting diodes. Compared to the conventional heterojunction org. light-emitting diodes, more than a factor of six improvement in **device**

reliability (a projected operating lifetime of 70,000 h) was achieved in the structure. The improvement in **device** lifetime is attributed to the elimination of the heterointerface present in the conventional **devices** which greatly affects the **device** reliability.

ST LED bipolar transport layer; org **electroluminescent device** bipolar transport layer

IT **Electroluminescent devices**
Electroluminescent devices
(org. light-emitting diodes with bipolar transport layers)

IT **147-14-8**, Copper phthalocyanine 2085-33-8, Tris(8-hydroxyquinolinato)aluminum 123847-85-8, N,N'-Diphenyl-N,N'-bis(1-naphthyl-(1,1'-biphenyl))-4,4'-diamine
RL: **DEV (Device component use)**; USES (Uses)
(org. light-emitting diodes with bipolar transport layers)

IT 67605-76-9
RL: **DEV (Device component use)**; MOA (Modifier or additive use); USES (Uses)
(org. light-emitting diodes with bipolar transport layers)

RE.CNT 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L46 ANSWER 53 OF 69 HCAPLUS COPYRIGHT 2003 ACS

AN 1998:204546 HCAPLUS
DN 128:263735
TI Organic **electroluminescent** element with exciplex-forming materials
IN Boerner, Herbert; Busselt, Wolfgang; Justel, Thomas; Nikol, Hans
PA Philips Patentverwaltung G.m.b.H., Germany; Philips Electronics N.V.
SO Eur. Pat. Appl., 11 pp.
CODEN: EPXXDW
DT Patent
LA German
IC ICM H05B033-14
ICS C09K011-06
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 25, 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 831676	A2	19980325	EP 1997-202820	19970915
	EP 831676	A3	19980715		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	DE 19638770	A1	19980326	DE 1996-19638770	19960921
	US 5955836	A	19990921	US 1997-933292	19970918
	JP 10106748	A2	19980424	JP 1997-256865	19970922
PRAI	DE 1996-19638770		19960921		

AB **Electroluminescent devices** are described which have an org. active **layer** comprising a **mixt.** of a hole-transporting material and an electron-transporting material which form an exciplex.

ST exciplex forming org material **electroluminescent device**
IT **Electroluminescent devices**
Exciplex
(org. **electroluminescent** elements with exciplex-forming materials)
IT **852-38-0**, 2-(4-Biphenylyl)-5-phenyl-1,3,4-**oxadiazole** **15082-28-7**, 2-(4-Biphenyly)-5-(4-tert-butylphenyl)-1,3,4-**oxadiazole** 58473-78-2 65181-78-4, N,N'-Diphenyl-N,N'-bis(3-methylphenyl)-1,1'-biphenyl-4,4'-diamine 124729-98-2, 4,4',4''-Tris(3-methylphenylphenylamino)triphenylamine 138171-14-9 205392-78-5
RL: **DEV (Device component use)**; USES (Uses)
(org. **electroluminescent** elements with exciplex-forming materials)

L46 ANSWER 54 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 1998:314575 HCAPLUS
DN 129:21311
TI **Electroluminescent device**
IN Spreitzer, Hubert; Lupo, Donald; Schenk, Hermann; Yu, Nu
PA Hoechst A.-G., Germany
SO Ger. Offen., 10 pp.
CODEN: GWXXBX
DT Patent
LA German
IC ICM H01L051-20
ICS H01L051-30; H01L051-40; H05B033-14; C09K011-06
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related

Properties)
Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 19646119	A1	19980514	DE 1996-19646119	19961108
	WO 9821758	A2	19980522	WO 1997-EP6004	19971030
	WO 9821758	A3	19980702		
	W: CA, CN, JP, KR, MX				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	EP 946995	A2	19991006	EP 1997-950052	19971030
	R: DE, FR, GB, NL				
	CN 1236486	A	19991124	CN 1997-199548	19971030
	JP 2001504629	T2	20010403	JP 1998-522103	19971030
	KR 2000053102	A	20000825	KR 1999-704026	19990506
PRAI	DE 1996-19646119	A	19961108		
	WO 1997-EP6004	W	19971030		

AB An **electroluminescent device** whose **electroluminescence** spectrum does not overlap with the absorption spectrum, contg. .gtoreq.2 org. layers between 2 electrodes, is characterized by: (a) 2 adjacent org. layers, each having an optical band gap of .gtoreq.2.5 eV; and (b) the wavelength (.lambda.max, corresponding to an energy Emax) at which the **electroluminescence** has a max. is in a region corresponding to the energy **difference** .DELTA.E (**ionization potential** of the 1st org. layer minus electron affinity of the 2nd org. layer), and Emax .ltoreq. 2.5 eV.

ST **electroluminescent device**

IT **Electroluminescent devices**
(having org. layers)

IT 37254-75-4, Aluminum 97, magnesium 3 50926-11-9, Indium tin oxide 164363-38-6 **171408-95-0** 189363-47-1
RL: **DEV (Device component use)**; USES (Uses)
(**electroluminescent devices** contg.)

L46 ANSWER 55 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 1998-574216 [49] WPIX
DNN N1998-447388 DNC C1998-172236
TI Organic **electroluminescent device** - contains organic hole implanting and transporting layer containing tertiary **aromatic amine** and polycyclic aromatic hydrocarbon.
DC E19 L03 X26
IN HOR, A; HU, N; ONG, B S; POPOVIC, Z D; XIE, S
PA (XERO) XEROX CORP
CYC 2
PI JP 10255985 A 19980925 (199849)* 10p H05B033-22
US 5989737 A 19991123 (200002) H05B033-12
ADT JP 10255985 A JP 1998-47122 19980227; US 5989737 A US 1997-807489 19970227
PRAI US 1997-807489 19970227
IC ICM H05B033-12; H05B033-22
ICS H05B033-14
ICA C09K011-06
AB JP 10255985 A UPAB: 19981210
The organic **EL device** comprises an anode, an organic hole implanting and hole transporting layer, an organic electron implanting and electron transporting layer, and a cathode. The organic hole implanting and transporting **layer** contains **mixture** of tertiary **aromatic amine** and polycyclic aromatic hydrocarbon cpd.

USE - The organic **EL device** is used as image bar element for the digital copy machines and printers.
ADVANTAGE - The organic **EL device**, having improved stability in operation and against heat, can be obtd.
Dwg.0/1
FS CPI EPI
FA AB; DCN
MC CPI: E08-A; E08-B; E08-C01; E08-C02; E08-D02; E08-D03; E10-B01A4; E10-J02B4; L03-C04; L03-G05
EPI: X26-J

L46 ANSWER 56 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 1997-274625 [25] WPIX
DNN N1997-227458 DNC C1997-088429
TI Organic electro-**luminescence devices** for flat emissive displays - containing organic tertiary **aromatic amines**, silanes, silazanes and phosphines as hole transporting materials.
DC E11 E14 L03 X26
IN GORSUCH, C A; SHI, S Q
PA (MOTI) MOTOROLA INC
CYC 7
PI EP 774883 A2 19970521 (199725)* EN 13p H05B033-14
R: DE FR GB
JP 09148073 A 19970606 (199733) 8p H05B033-22
EP 774883 A3 19970730 (199743) H05B033-14
KR 97032292 A 19970626 (199828) H05B033-14
TW 330368 A 19980421 (199839) H05B033-20
US 5804322 A 19980908 (199843) H05B033-00
EP 774883 B1 20020724 (200256) EN H05B033-14
R: DE FR GB
DE 69622507 E 20020829 (200264) H05B033-14
ADT EP 774883 A2 EP 1996-118022 19961111; JP 09148073 A JP 1996-321080 19961115; EP 774883 A3 EP 1996-118022 19961111; KR 97032292 A KR 1996-53875 19961114; TW 330368 A TW 1996-113278 19961030; US 5804322 A US 1995-560453 19951117; EP 774883 B1 EP 1996-118022 19961111; DE 69622507 E DE 1996-622507 19961111, EP 1996-118022 19961111
FDT DE 69622507 E Based on EP 774883
PRAI US 1995-560453 19951117
REP 2.Jnl.Ref; EP 510541; EP 517542; EP 611148; EP 650955; JP 04161480; US 5061569; US 5256945; WO 9014744
IC ICM H05B033-00; H05B033-14; H05B033-20; H05B033-22
ICS C09K011-06; H05B033-12
AB EP 774883 A UPAB: 19970619
Organic **electroluminescence devices** (10) comprises a cathode (16), an electronic transporting zone (15), an emitting zone (14), a hole transporting zone (13) and an anode (12) which are laminated in sequence. The hole transporting zone contains at least one hole transporting **layer** comprising homogeneously **mixed** hole transporting materials which: (i) each have a glass transition temperature >75 deg. C.. (ii) are structurally compatible so as to form a stable, homogeneous, uniform film; and (iii) are selected from organic tertiary **aromatic amines**, aromatic silanes, silazanes and phosphines of formulae (I), (II), (III) and (IV), respectively: Ar1, Ar2, and Ar3 = aromatic hydrocarbons, or aromatic tertiary amine moieties, optionally substituted with alkyl, alkoxy, alkylamine, aryl, aryloxy, arylamine and halo, e.g. bromide, chloride, and fluoride.
USE - The organic **electroluminescent devices** are useful in full colour flat emissive displays for driving at high electric

current density to obtain high brightness.
ADVANTAGE - The materials are less susceptible to thermal degradation than prior art materials and provide improved durability.
Dwg.1/1
FS CPI EPI
FA AB; GI; DCN
MC CPI: E05-E01; E05-G02; E10-B01A2; E10-B03A; E10-B04A2; L03-C04A; L03-H04A

L46 ANSWER 57 OF 69 HCAPLUS COPYRIGHT 2003 ACS DUPLICATE 6
AN 1997:265169 HCAPLUS
DN 127:10614
TI Electrochemical redox behavior and **electroluminescence** in the mixed energy-sufficient system thianthrene and 2-(4-biphenyl)-5-(4-tert-butylphenyl)-1,3,4-**oxadiazole**
AU Janietz, Silvia; Wedel, Armin
CS Fraunhofer Institute Applied Polymer Chemistry, Teltow, D-14513, Germany
SO Advanced Materials (Weinheim, Germany) (1997), 9(5), 403-407
CODEN: ADVMEW; ISSN: 0935-9648
PB VCH
DT Journal
LA English
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 72
AB The electrochem. redox behavior of the title compds. TH and PBD individually in soln. was described, followed by the prepn. of LEDs. The characteristics (redox potential, I-V, C-V, UV/visible absorption, **luminescence**, and **electroluminescence**) of **mixed** single-**layer** (polycarbonate (PC)-blended with a 1:1 mixt. of TH and PBD) and sepd. double-layer (PC + TH, PBD + polystyrene) **devices** suggested that both compds. could be useful for the construction of LEDs.
ST thianthrene phenyl **oxadiazole** redox behavior LED; **electroluminescence** elec property thianthrene phenyl **oxadiazole**; HOMO LUMO thianthrene **biphenyloxadiazole** LED
IT **Luminescence**
Luminescence, electroluminescence
UV and visible spectra
(and electrochem. redox behavior in the mixed system thianthrene and biphenyl-(tert-butylphenyl)-**oxadiazole** suitable for construction of LEDs)
IT Redox potential
(electrochem.; and **electroluminescence** in the mixed system thianthrene and biphenyl-(tert-butylphenyl)-**oxadiazole** suitable for construction of LEDs)
IT Redox reaction
(electrochem.; electrochem. redox behavior and **electroluminescence** in mixed energy-sufficient system thianthrene and 2-(4-biphenyl)-5-(4-tert-butylphenyl)-1,3,4-**oxadiazole**)
IT HOMO (molecular orbital)
LUMO (molecular orbital)
(in the mixed system thianthrene and biphenyl-(tert-butylphenyl)-**oxadiazole** derived from cyclic voltammograms)
IT 92-85-3, Thianthrene **15082-28-7**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(electrochem. redox behavior and **electroluminescence** in the

mixed system thianthrene and biphenyl-(tert-butylphenyl)-**oxadiazole** suitable for construction of LEDs)

L46 ANSWER 58 OF 69 INSPEC COPYRIGHT 2003 IEE
AN 1997:5577419 INSPEC DN B9706-4260D-018
TI Injection and charge transport processes of polymer light emitting diodes.
AU Wedel, A.; Janietz, S.; Danz, R. (Fraunhofer-Inst. of Appl. Polymer Res., Teltow, Germany)
SO 9th International Symposium on Electrets (ISE 9) Proceedings (Cat.No96CH35808)
Editor(s): Xia Zhongfu; Zhang Hongyan
New York, NY, USA: IEEE, 1996. p.373-7 of xxi+1120 pp. 7 refs.
Conference: Shanghai, China, 25-30 Sept 1996
Sponsor(s): IEEE Dielectr. & Electr. Insulation Soc
Price: CCCC CH3508/96/0-7803-2695-4/96/$04.00
ISBN: 0-7803-2695-4
DT Conference Article
TC Experimental
CY United States
LA English
AB We investigated thianthrene (TH) and 2-(4-biphenyl)-5-(4-t-butylphenyl)-1,3,4-**oxadiazole** (PBD), which is known to be a good scintillator dye and have good electron transport properties, separately by cyclic voltammetry in solution. All electrochemical measurements were performed in solutions of N-methylporrolidone in the reduction region and in acetonitrile (for PBD) and dichloromethane (for TH) in the oxidation direction. We also investigated the current-voltage (I-U) characteristics for testing the diode character and capacitance-voltage (C-V) behaviour of different single and double layer structures to describe the function of such **devices**. For LED fabrication, TH and PBD were mixed with 20% polycarbonate (PC) dissolved in chloroform, so that a **mixed** single **layer** with a thickness of 150 nm as an LED blend structure was built up.
CC B4260D Light emitting diodes; B4220 Luminescent materials
CT CAPACITANCE; **ELECTROLUMINESCENCE**; LIGHT EMITTING DIODES; ORGANIC COMPOUNDS; OXIDATION; POLYMER BLENDS; REDUCTION (CHEMICAL); VOLTAMMETRY (CHEMICAL ANALYSIS)
ST polymer light emitting diodes; injection processes; charge transport processes; thianthrene; **2-(4-biphenyl)-5-(4-t-butylphenyl)-1,3,4-oxadiazole**; scintillator dye; electron transport properties; cyclic voltammetry; electrochemical measurements; N-methylporrolidone solution; reduction region; acetonitrile solution; dichloromethane solution; oxidation direction; current-voltage characteristics; capacitance-voltage behaviour; single layer structures; double layer structures; LED fabrication; polycarbonate; **mixed single layer**; LED blend structure; **electroluminescence spectrum**
ET N; I*U; I-U; C*V; C-V

L46 ANSWER 59 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 1996-047489 [05] WPIX
DNN N1996-039974 DNC C1996-015605
TI Organic electric field **luminescent device** display or light source, etc., - contg. aluminium complex and other metal complex both contg. 8-hydroxy quinone as ligand..
DC E12 L03 P85 U14
PA (MITU) MITSUBISHI CHEM CORP
CYC 1
PI JP 07312289 A 19951128 (199605)* 16p H05B033-22

ADT JP 07312289 A JP 1994-103812 19940518
PRAI JP 1994-103812 19940518
IC ICM H05B033-22
ICS C09K011-06; G09F009-30
AB JP 07312289 A UPAB: 19960205
At least an organic hole transporting layer sandwiched by an anode and a cathode, and an organic **luminescent** layer are provided on a substrate. The organic hole transporting **layer** consists of a **mixt.** of at least two **aromatic amines**. The organic **luminescent layer** contains a **mixt.** of an aluminium complex having 8-hydroxyquinoline as a ligand and a metal complex using a metal different from aluminium, including zinc, beryllium, or magnesium, having 8-hydroxyquinoline as a ligand.
USE - For a flat panel display, a source of light for a copying machine, a facsimile machine, a liq. crystal display, measuring instruments; a display board, or a market light.
ADVANTAGE - The use of specific cpds. for the organic hole transporting layer and the organic **luminescent** layer gives a large area light source with no short circuit, a matrix driving dot panel having no defects.
Dwg.0/4
FS CPI EPI GMPI
FA AB; DCN
MC CPI: E05-B01; E05-B03; E05-L03D; L03-C04A
EPI: U14-H01A; U14-J02

L46 ANSWER 60 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 1994:641370 HCAPLUS
DN 121:241370
TI Organic **electroluminescent devices**
IN Naito, Katsuyuki
PA Tokyo Shibaura Electric Co, Japan
SO Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H05B033-14
ICS C09K011-06
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 06096860	A2	19940408	JP 1992-243790	19920911
PRAI JP 1992-243790		19920911		

AB The title **device** comprises: an amorphous phosphor **layer** contg. a **mixt.** of the phosphor and a compd. which will be converted to the phosphor by the heat generated by the **device** during the operation, wherein the process prevents the growth of the microcrystallites in the phosphor layer, thus gives a long-life **device** stability.
ST **electroluminescent** amorphous org phosphor recrystn prevention
IT **Electroluminescent devices**
(stabilization of **device** by **mixing** phosphor with **compd.** thermally convertible to phosphor for preventing recrystn.)
IT Phosphors
(stabilization of **electroluminescent device** by

mixing electron-transporter with **compd**. thermally convertible to transporter for preventing recrystn.)

IT 58473-78-2
RL: **DEV (Device component use)**; NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses) (hole-transporter in org. **electroluminescent devices**)

IT 58726-62-8 158606-18-9 **158606-19-0 158606-20-3**
RL: **DEV (Device component use)**; NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses) (stabilization of **electroluminescent device** by **mixing** electron-transporter with **compd**. thermally convertible to transporter for preventing recrystn.)

IT **148044-06-8 148044-16-0** 151225-88-6 158606-12-3 158606-13-4 158606-14-5 **158606-15-6 158606-16-7 158606-17-8**
RL: **DEV (Device component use)**; NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses) (stabilization of **electroluminescent device** by **mixing** phosphor with **compd**. thermally convertible to phosphor for preventing recrystn.)

L46 ANSWER 61 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 1994-210998 [26] WPIX
CR 1994-115411 [14]; 1994-147916 [18]; 1994-163911 [20]
DNN N1994-166159 DNC C1994-096417
TI Low power **electroluminescent** for surface display element - comprises anode, cathode and organic cpd layers between the two electrodes, one layer being an **oxadiazole** cpd..
DC E13 G08 L03 U11 U14
IN ADACHI, C; NAGAI, K; OHTA, M; SAKON, Y; TAKAHASHI, T
PA (RICO) RICOH KK
CYC 2

PI					
JP 06145658	A	19940527 (199426)*	17p	C09K011-06
US 5420288	A	19950530 (199527)		C07D413-10
US 5597925	A	19970128 (199710)	49p	C07D271-07
US 5610309	A	19970311 (199716)	51p	C07D413-10
US 5656401	A	19970812 (199738)	50p	C09K019-34

ADT JP 06145658 A JP 1993-98890 19930401; US 5420288 A US 1993-51070 19930414; US 5597925 A Div ex US 1993-51070 19930414, Div ex US 1994-321765 19941012, US 1995-476681 19950607; US 5610309 A Div ex US 1993-51070 19930414, Div ex US 1994-321765 19941012, US 1995-478674 19950607; US 5656401 A Div ex US 1993-51070 19930414, US 1994-321765 19941012
FDT US 5597925 A Div ex US 5420288; US 5610309 A Div ex US 5420288; US 5656401 A Div ex US 5420288
PRAI JP 1992-273692 19920917; JP 1992-121194 19920414; JP 1992-174801 19920609; JP 1992-186051 19920620; JP 1992-219792 19920727; JP 1992-284041 19920929
IC ICM C07D271-07; C07D413-10; C09K011-06; C09K019-34
ICS H05B033-14; H05B033-22
AB JP 06145658 A UPAB: 19971125
An **electroluminescent** element consisting of an anode, a cathode and one or a number of organic cpd layers interposed between two electrodes, in which at least one organic layer contains at least one kind of **oxadiazole** cpd selected from **oxadiazole** cpds of formulas (I), (II), (III), (IV) (V) and (VI).

In formulas (I), (II), (III), (IV), (V) and (VI), R1 and R2= H, halogen, opt substd alkyl, alkoxy, opt substd amino, or cyano gp, Ar1 and

Ar2= opt substd aromatic hydrocarbon or opt substd aromatic heterocyclic gp.

USE/ADVANTAGE - The **electroluminescent** element is suitable as a surface display element for information equipment which consumes less electric power and occupies less space as compared with a conventional cathode ray tube. It can be driven with low driving voltage and generate brighter emission of various colours for a longer period. Furthermore the mfg of the element is easy, and so large area elements are obtd with a high yield and a relatively low cost.

Dwg.0/9

FS CPI EPI
FA AB; GI; DCN
MC CPI: E07-E04; E07-H03; E07-H04; E25-B01; L03-C04A
EPI: U11-A15; U14-J02

L46 ANSWER 62 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 1994-163911 [20] WPIX
CR 1994-115411 [14]; 1994-147916 [18]; 1994-210998 [26]
DNN N1994-129224 DNC C1994-075016
TI **Oxadiazole** cpds. for **electroluminescence devices** - having film forming, fluorescence and electron transport props exhibiting blue luminance and stability.
DC E13 G08 L03 U11 U14
IN ADACHI, C; NAGAI, K; OHTA, M; SAKON, Y; TAKAHASHI, T
PA (RICO) RICOH KK
CYC 2

PI	JP 06107648	A	19940419 (199420)*	14p	C07D271-10
	US 5597925	A	19970128 (199710)	49p	C07D271-07
	US 5610309	A	19970311 (199716)	51p	C07D413-10
	US 5656401	A	19970812 (199738)	50p	C09K019-34

ADT JP 06107648 A JP 1992-284041 19920929; US 5597925 A Div ex US 1993-51070 19930414, Div ex US 1994-321765 19941012, US 1995-476681 19950607; US 5610309 A Div ex US 1993-51070 19930414, Div ex US 1994-321765 19941012, US 1995-478674 19950607; US 5656401 A Div ex US 1993-51070 19930414, US 1994-321765 19941012
FDT US 5597925 A Div ex US 5420288; US 5610309 A Div ex US 5420288; US 5656401 A Div ex US 5420288
PRAI JP 1992-284041 19920929; JP 1992-121194 19920414; JP 1992-174801 19920609; JP 1992-186051 19920620; JP 1992-219792 19920727; JP 1992-273692 19920917; JP 1993-98890 19930401
IC ICM C07D271-07; C07D271-10; C07D413-10; C09K019-34
ICS C09K011-06
AB JP 06107648 A UPAB: 19950721
An **oxadiazole** cpd. of formula (I) is new, where Ar=opt. substd. aryl other than phenyl and 4-tert.-butylphenyl.

Pref., (I) is prepd. by reacting 5,5'-(4,4'-dibenzyl)ditetrazole of formula (II) and a carboxylic chloride of formula (III).

USE/ADVANTAGE - The **oxadiazole** cpds. have film-forming properties, fluorescence and electron transport properties and are useful as materials for **electroluminescent devices** with sufficient blue luminance and stability(durability) and also as electron transport materials.

Dwg.0/0

FS CPI EPI
FA AB; GI; DCN
MC CPI: E07-E04; G04-A; G06-F06; L03-C02B; L03-H04A
EPI: U11-A15

L46 ANSWER 63 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 1994-147916 [18] WPIX
CR 1994-115411 [14]; 1994-163911 [20]; 1994-210998 [26]
DNN N1994-116308 DNC C1994-067976
TI Novel **oxadiazole** substd di(trifluoromethyl) diphenylmethane cpds - having high emission luminance and stable film forming properties for **electroluminescent device**.
DC E13 G08 L03 U11 U14
IN ADACHI, C; NAGAI, K; OHTA, M; SAKON, Y; TAKAHASHI, T
PA (RICO) RICOH KK
CYC 2
PI JP 06092947 A 19940405 (199418)* 15p C07D271-10
US 5597925 A 19970128 (199710) 49p C07D271-07
US 5610309 A 19970311 (199716) 51p C07D413-10
US 5656401 A 19970812 (199738) 50p C09K019-34
JP 3341090 B2 20021105 (200275) 17p C07D271-10
ADT JP 06092947 A JP 1993-114005 19930416; US 5597925 A Div ex US 1993-51070 19930414, Div ex US 1994-321765 19941012, US 1995-476681 19950607; US 5610309 A Div ex US 1993-51070 19930414, Div ex US 1994-321765 19941012, US 1995-478674 19950607; US 5656401 A Div ex US 1993-51070 19930414, US 1994-321765 19941012; JP 3341090 B2 JP 1993-114005 19930416
FDT US 5597925 A Div ex US 5420288; US 5610309 A Div ex US 5420288; US 5656401 A Div ex US 5420288; JP 3341090 B2 Previous Publ. JP 06092947
PRAI JP 1992-219792 19920727; JP 1992-121194 19920414; JP 1992-174801 19920609; JP 1992-186051 19920620; JP 1992-273692 19920917; JP 1992-284041 19920929; JP 1993-98890 19930401
IC ICM C07D271-07; C07D271-10; C07D413-10; C09K019-34
ICS C07C243-38; C07D257-02; C09K011-06
AB JP 06092947 A UPAB: 20021120
Oxadiazole derivatives of formula (I) are new: Ar = opt. substd. aryl gp., opt. substd. heterocyclic aromatic ring.
Production of a cpd. (I), which comprises allowing a cpd. (II) to react with a cpd. (III) to give a cpd. (IV), followed by subjecting the reaction product to dehydration is also new: Ar is as defined above; X = halogen atom.
USE/ADVANTAGE - The cpd. (I) shows high emission luminance and has a stable film-forming property, thus being useful as an effective component of an **electroluminescence device**.
In an example, to 10.01g of hydrazine hydride was added 4.20g of 2,2-bis(4-methoxy carbonylphenyl)hexafluoropropane. The reaction was allowed to proceed for 3 hours at about 90 deg. C. The reaction mixt. was left to cool and was poured into about 200ml of ice-water. The resulting white ppte. was collected by filtration, followed by washing with water and then dried to give 3.90g (yield 93.5%). The product was recrystallised from N,N-DMF water to give 3.35g (yield 79.7%) of cpd (II) as colourless plates (yield 79.7%), m.p. 269.0 - 271.0 deg. C.
Dwg.0/6
Dwg.0/6
FS CPI EPI
FA AB; DCN
MC CPI: E07-E04; L03-C04A
EPI: U11-A15

L46 ANSWER 64 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 1994-115411 [14] WPIX
CR 1994-147916 [18]; 1994-163911 [20]; 1994-210998 [26]
DNN N1994-090465
TI **Electroluminescent** element with improved durability and long

term brightness - comprises anode, cathode and single or laminated organic cpd. layer comprising at least an **oxadiazole** cpd..

DC E13 G08 L03 U11 U14
IN ADACHI, C; NAGAI, K; OHTA, M; SAKON, Y; TAKAHASHI, T
PA (RICO) RICOH KK
CYC 2
PI JP 06065569 A 19940308 (199414)* 10p C09K011-06
US 5597925 A 19970128 (199710) 49p C07D271-07
US 5610309 A 19970311 (199716) 51p C07D413-10
US 5656401 A 19970812 (199738) 50p C09K019-34
ADT JP 06065569 A JP 1993-104993 19930407; US 5597925 A Div ex US 1993-51070 19930414, Div ex US 1994-321765 19941012, US 1995-476681 19950607; US 5610309 A Div ex US 1993-51070 19930414, Div ex US 1994-321765 19941012, US 1995-478674 19950607; US 5656401 A Div ex US 1993-51070 19930414, US 1994-321765 19941012
FDT US 5597925 A Div ex US 5420288; US 5610309 A Div ex US 5420288; US 5656401 A Div ex US 5420288
PRAI JP 1992-186051 19920620; JP 1992-121194 19920414; JP 1992-174801 19920609; JP 1992-219792 19920727; JP 1992-273692 19920917; JP 1992-284041 19920929; JP 1993-98890 19930401
IC ICM C07D271-07; C07D413-10; C09K011-06; C09K019-34
ICS H05B033-14
AB JP 06065569 A UPAB: 19950721

Electroluminescent element, which emits light when an electric field is applied, consists of an anode, a cathode and a single or laminated organic cpd. layer sandwiched between the electrodes. At least one of the organic cpd. layers is composed of an **oxadiazole** cpd. shown by formula (1), where Ar is substd. or non-substd. alkyl gp., substd. or non-substd. aryl gp. or substd. or non-substd. heterocyclic aromatic ring. Ar includes 1-6C straight chain or branched alkyl, phenyl, naphthyl, anthoryl, acenaphthenyl, fluorenyl, phenanthoryl, styryl, pyridyl, pyrimidyl, furanyl, pyrrolyl, thiophenyl, quinolyl, benzofuranyl, benzothiophenyl, indolyl, carbazolyl, benzo-oxazolyl and quinoxylyl gps.

The **electroluminescent** element is prepared by forming (a) organic hole transporting layer, (b) organic **luminescent** layer and (c) organic electron transporting layer, or (b) and (c) in alphabetical order from anode side, or forming (a) between an anode and a cathode, and (a) is composed of the **oxadiazole** cpd. of formula (1). The **oxadiazole** cpd. is formed into film by vacuum deposition or soln. coating.

ADVANTAGE - The **electroluminescent** element has high durability and emits light with improved brightness over a long period.

Dwg.0/4
Dwg.0/4
FS CPI EPI
FA AB
MC CPI: E07-E04; L03-C04A
EPI: U11-A15

L46 ANSWER 65 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 1993-095221 [12] WPIX
DNN N1993-072804 DNC C1993-042040
TI High brightness, low dispersion **electroluminescent** element - contains anode for injecting hole, cathode for injecting electrons, and intermediate with organic **luminescent** layer contg. hole donor and electron donor.
DC A85 E19 L03 U14
IN ENDO, H; MORI, Y

PA (ASAH) ASAHI KASEI KOGYO KK; (ASAH) ASAHI CHEM IND CO LTD
CYC 4
PI EP 532798 A1 19930324 (199312)* EN 41p H05B033-14
CA 2051758 A 19930319 (199322)# H05B033-14
US 5281489 A 19940125 (199405)# 26p H05B033-14
EP 532798 B1 19951206 (199602) EN 45p H05B033-14
DE 69115272 E 19960118 (199608) H05B033-14
CA 2051758 C 19961105 (199704)# H05B033-14
KR 9506078 B1 19950608 (199712)# C09K011-00
ADT EP 532798 A1 EP 1991-202363 19910916; CA 2051758 A CA 1991-2051758 19910918; US 5281489 A US 1991-760190 19910916; EP 532798 B1 EP 1991-202363 19910916; DE 69115272 E DE 1991-615272 19910916, EP 1991-202363 19910916; CA 2051758 C CA 1991-2051758 19910918; KR 9506078 B1 KR 1991-16139 19910916
FDT DE 69115272 E Based on EP 532798
PRAI EP 1991-202363 19910916; CA 1991-2051758 19910918; US 1991-760190 19910916; KR 1991-16139 19910916
REP 2.Jnl.Ref; JP 02289675; JP 03000790; US 4725513
IC ICM C09K011-00; H05B033-14
ICS C09K011-06
AB EP 532798 A UPAB: 19931122
A novel **electroluminescent** element comprises an anode and a cathode, at least one of which is transparent and between which is disposed an organic **luminescent layer** comprising a **mixt.** of fluorescent **luminescent** agent (LA), an agent (I) donating anode-injected holes to the (LA) and an agent (II) donating cathode-injected electrons to the (LA).

(II) has a first redn. potential which is noble as compared to -2.00V. The (LA) has a first oxidn. ptoential equal to or less noble relative to that of (I) and a first redn. potential equal to or noble relative to that of (II) These potentials are measured by cyclic voltammetry using a soln. of the agent in a solvent.

USE/ADVANTAGE - The pref. A.C-driven element can be used e.g. in displays, backlights for LCDs or erasing light sources for copiers. It shows high **luminescence** efficiency and brightness even at low voltages, with a statistical brightness dispersion of not greater than 5% relative to ave. brightness being claimed.

1/2

Dwg.1/2
FS CPI EPI
FA AB; GI; DCN
MC CPI: A12-E11; E24-A; L03-C03
EPI: U14-J02

L46 ANSWER 66 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 1993:90503 HCAPLUS
DN 118:90503
TI Organic **electroluminescent device**
IN Sato, Yoshiharu; Saida, Atsuro
PA Mitsubishi Kasei Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C09K011-06
ICS H05B033-14
CC 73-12 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 04161480	A2	19920604	JP 1990-287959	19901025
PRAI	JP 1990-287959		19901025		

AB The title **device**, suited for use as a flat panel display or a light source, comprises an org. hole injection/transport layer and an org. **luminescent** layer formed between 2 electrode layers, wherein the hole injection/transport **layer** consists of a **mixt.** of .gtoreq.2 **arom. amines.**

ST **arom amine** hole **electroluminescent** layer

IT **Electroluminescent devices**
(film, org.)

IT 65181-78-4 116942-09-7 131852-82-9 136482-43-4 137786-38-0 145024-29-9
RL: USES (Uses)
(hole injection/transport thin films from, for **electroluminescent devices**)

L46 ANSWER 67 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 1991-018218 [03] WPIX
DNN N1991-013968 DNC C1991-007690
TI **Electroluminescent device** - comprises 2 electrodes sandwiching **luminescent** layer of hole carrier organic cpd. and electron carrier fluorescent organic cpd..
DC E13 E14 G04 L03 U11 U14
PA (RICO) RICOH KK
CYC 1
PI JP 02289676 A 19901129 (199103)*
ADT JP 02289676 A JP 1989-142654 19890605
PRAI JP 1989-7089 19890113; JP 1989-142654 19890605
IC C09K011-06; H05B033-14
AB JP 02289676 A UPAB: 19930928
Electroluminescent device consists of two electrodes and **luminescent** layer of organic thin membrane between them.
The layer is laminates of hole carrier organic cpd. and electron carrier fluorescent organic **cpd.** or their **mixt.** membrane. The fluorescent organic cpd. is perinone deriv. of general formula (I) or (II).
The membrane of hole carrier organic cpd. is 200-1000 Angstroms thick. The cpd. is pref. amorphous solid and transparent at 400 nm or longer wave length, such as triphenylamines, stilbene deriv. or **oxadiazoles.** The fluorescent organic cpd. membrane is 400-1500 Angstroms thick. The mixt. membrane is prepd. by vacuum evaporation, coating or fusion.
USE/ADVANTAGE - It is useful for plane luminous body with large area. Its preparation is simple. It gives brightness and endurance. It is luminiferous long time.
1/1
FS CPI EPI
FA AB; GI; DCN
MC CPI: E24-A03; G04-A; L03-H04A
EPI: U11-A09; U14-J

L46 ANSWER 68 OF 69 WPIX (C) 2003 THOMSON DERWENT
AN 1991-018217 [03] WPIX
DNN N1991-013967 DNC C1991-007689

TI **Electroluminescent device** - comprises 2 electrodes sandwiching **luminescent** layer of hole carrier organic cpd. and electron carrier fluorescent organic cpd..
DC E19 L03 U11 U14
PA (RICO) RICOH KK
CYC 1
PI JP 02289675 A 19901129 (199103)*
ADT JP 02289675 A JP 1989-142652 19890605
PRAI JP 1989-7088 19890113; JP 1989-142652 19890605
IC C09K011-06; H05B033-14
AB JP 02289675 A UPAB: 19930928
Electroluminescent device comprises two electrodes and **luminescent** layer of organic thin membrane between them. The layer is laminates of hole carrier organic cpd. and electron carrier fluorescent organic **cpd**. or their **mixt**. membrane. The fluorescent organic cpd. is cyclopentadiene deriv. of general formula (I). Where, R1-R6 are each H, (un)substd. alkyl, halogen, (un)substd. alkoxy, acyl, -OH, aryloxy, (un)substd. aryl.
The membrane of hole carrier organic cpd. is 200-1000 Angstroms thick. The compound is pref. amorphous solid and transparent at 400 nm or longer wave length, such as triphenylamines, stilbene derivs. or **oxadiazoles**. The fluorescent organic cpd. membrane is 400-1500 Angstroms thick.
USE/ADVANTAGE - It is useful for plane luminous body with large area. The prepn. is simple. It gives brightness and endurance. It has blue **luminescence**. It is luminiferous for a long time. @(8pp Dwg.No.1/1)@
FS CPI EPI
FA AB; GI; DCN
MC CPI: E07-E04; E10-B01A4; E10-B04A; E10-E04; E10-G02F; E10-H01; E10-H02; E10-J02B4; L03-H04A
EPI: U11-A09; U14-J

L46 ANSWER 69 OF 69 HCAPLUS COPYRIGHT 2003 ACS
AN 1982:627609 HCAPLUS
DN 97:227609
TI Organic **electroluminescent** cells
PA Eastman Kodak Co., USA
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC C09K011-06; F21K002-00; H01J029-20; H05B033-00
CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73, 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 57051781	A2	19820326	JP 1981-110988	19810717
	JP 01007635	B4	19890209		
	US 4356429	A	19821026	US 1980-169705	19800717
PRAI	US 1980-169705		19800717		

AB An org. **electroluminescent** cell is composed of a pos. electrode, a neg. electrode, an org. **electroluminescent** layer composed of org. **electroluminescent** phosphors and a dielec. binder whose insulation breakdown voltage is .gtoreq.105 V/cm, and a porphine type compd.-contg. pos. hole injection region formed between the pos. electrode

and the phosphor layer. Phthalocyanine derivs. are esp. useful as the porphine type compds. Thus, Cu phthalocyanine (I) was vacuum deposited on a glass support having a transparent conductor **layer**, then a **mixt**. of polystyrene and tetraphenylbutadiene (1:4 by wt.) was coated on the I layer, and Ag was then vacuum deposited on the **mixt**. **layer** to give an **electroluminescent** cell. A blue emission (.apprx.467 nm; 5.1 .times. 10-4 candela/cm) was obtained at 20 V and 30-40 mA/cm2.

ST org **electroluminescent** cell; optical display **device** **electroluminescent**

IT **Electroluminescent devices**
(org., with pos. hole-injection layers from porphines)

IT 9003-53-6 9003-54-7 9017-21-4 26009-55-2
RL: USES (Uses)
(binder resin, for org. **electroluminescent** compns. for display cells)

IT 632-51-9 806-71-3 55034-79-2
RL: USES (Uses)
(phosphor, for **electroluminescent** display cells)

IT **147-14-8 574-93-6**
RL: USES (Uses)
(pos.-hole injection layer of, for org. **electroluminescent** display cells)